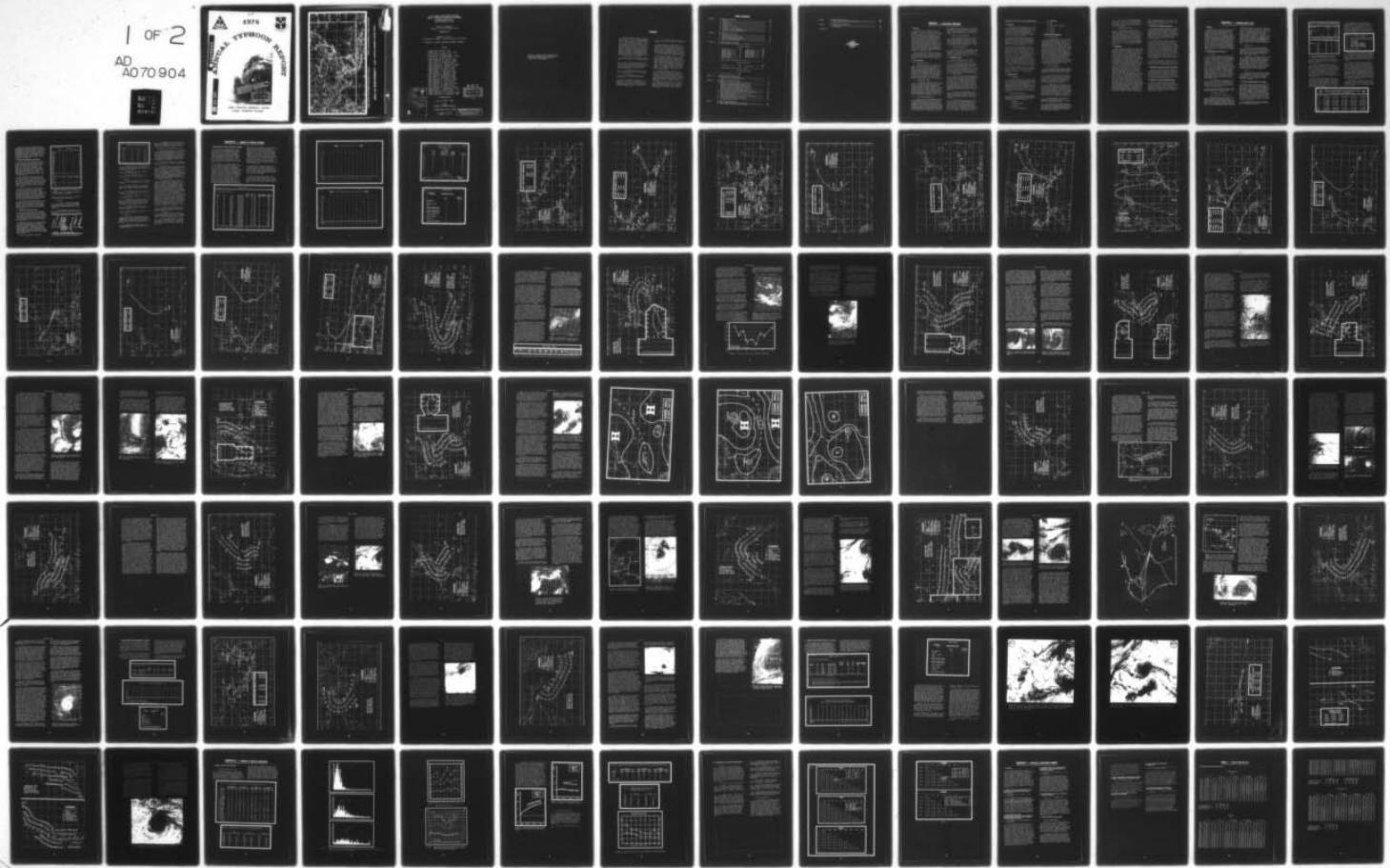


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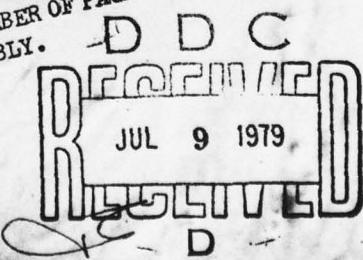
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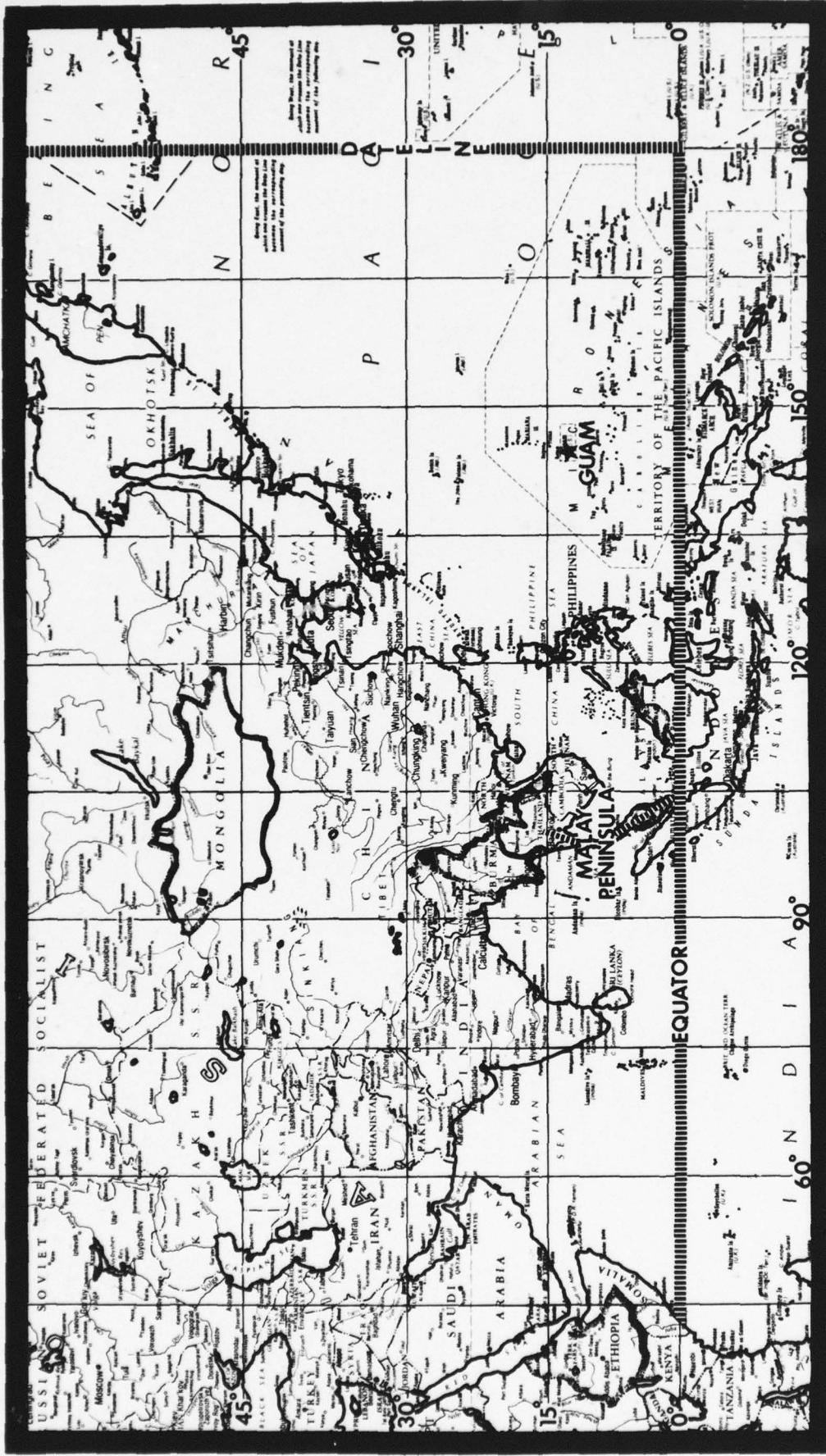
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JOINT TYPHOON WARNING CENTER
GUAM, MARIANA ISLANDS



Indian Ocean Area (Malay Peninsula to Africa)

Pacific Area (Dateline to Malay Peninsula)

AREA OF RESPONSIBILITY - JOINT TYPHOON WARNING CENTER, GUAM

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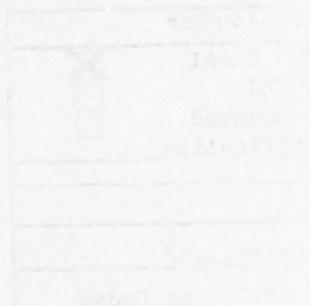
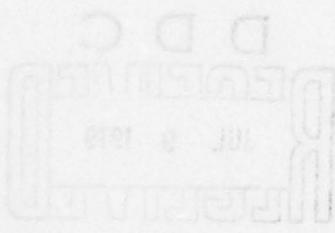
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NOVEMBER 1979
1978-1979 TROPICAL CYCLONE SEASON
TROPICAL CYCLONE SEASON
NOVEMBER 1979

FRONT COVER: Super Typhoon Rita at 150 kt (77 m/sec)
strength and intensifying over the Philippine Sea,
24 October 1978, 2319Z. Details of Rita can be
found on page 57. (DMSP imagery)



FOREWORD

The Annual Typhoon Report is prepared by the staff of the Joint Typhoon Warning Center (JTWC). JTWC is a combined USAF/USN entity operating under the command of the U. S. Fleet Weather Central, Guam. The senior Air Force officer assigned is designated as Director, JTWC and is responsible to the Commanding Officer, U. S. Fleet Weather Central, Guam for the operation of the JTWC. The senior Naval Officer of the JTWC is designated as the Deputy Director/Operations Officer. The JTWC was established by CINCPACFLT message 280208Z April 1959 when directed by CINCPAC message 230233Z April 1959. Its operation is guided by the CINCPACINST 3140.1 (series).

The Fleet Weather Central/Joint Typhoon Warning Center, Guam has the responsibility to:

1. Provide continuous meteorological watch of all tropical activity north of the equator, west of the Date Line, and east of the African coast (JTWC area of responsibility) for potential tropical cyclone development;
2. Provide warnings for all significant tropical cyclones in the assigned area of responsibility;
3. Determine tropical cyclone reconnaissance requirements and assign priorities;
4. Conduct an annual post analysis of all tropical cyclones occurring within the area north of the equator from 140W west to the coast of Africa and prepare an Annual Typhoon Report for issuance to interested agencies; and

5. Conduct tropical cyclone forecasting and detection research as practicable.

In the event of incapacitation of the JTWC, the alternate (AJTWC) assumes the responsibility for the issuance of warnings. The U. S. Fleet Weather Central, Pearl Harbor, Hawaii is designated as the AJTWC. Assistance in determining tropical cyclone reconnaissance requirements and in obtaining reconnaissance data is provided by Detachment 4, 1st Weather Wing, Hickam AFB, Hawaii.

The Central Pacific Hurricane Center, (CPHC) Honolulu, Hawaii is manned by personnel of the U. S. National Weather Service who are responsible for the issuance of tropical cyclone warnings for the area north of the equator from the Date Line east to 140W. Warnings are issued in coordination with the U. S. Fleet Weather Central, Pearl Harbor and Detachment 4, 1WW, Hickam AFB, Hawaii. Post analysis information is forwarded to the JTWC for inclusion in the Annual Typhoon Report.

The meteorological services of the United States are planning to implement the metric system of measurement over the next few years. Some civilian and military agencies have started the education program by showing the metric equivalents to current units of measure. This Annual Typhoon Report includes metric equivalents to most measures.

Unless otherwise stated all satellite data used in this ATR are Air Force Weather Service DMSP Data as acquired by OL-C, 27CS personnel and analyzed by Det 1, 1WW personnel colocated with the JTWC at Nimitz Hill, Guam.

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CHAPTER I - OPERATIONAL PROCEDURES

1. GENERAL

Routine services provided by the Joint Typhoon Warning Center (JTWC) include the following: (1) Significant Tropical Weather Advisories issued daily describing all tropical disturbances and their potential for further development; (2) Tropical Cyclone Formation Alerts issued whenever interpretation of satellite and synoptic data indicates likely formation of a significant tropical cyclone; (3) Tropical Cyclone Warnings issued four times daily whenever a significant tropical cyclone exists in the Pacific area; (4) Tropical Cyclone Warnings issued twice daily whenever a significant tropical cyclone exists in the Indian Ocean area; and (5) Prognostic Reasoning messages issued twice daily for tropical storms and typhoons in the Pacific area.

JTWC responds to changing requirements of activities serviced. Therefore, contents of routine services are subject to change from year to year usually as a result of the Annual Tropical Cyclone Conference deliberations.

2. DATA SOURCES

a. COMPUTER PRODUCTS:

FLEWEACEN Guam provides computerized meteorological/oceanographic products for JTWC. In addition, the standard array of synoptic-scale computer analyses and prognostic charts are available from the Fleet Numerical Weather Central (FNWC) at Monterey, California via FLEWEACEN Guam. With the installation of the Naval Environmental Display Stations (NEDS) during 1978, JTWC now has very timely access to necessary FNWC products and is thereby able to more efficiently and effectively use this information.

b. CONVENTIONAL DATA:

Conventional meteorological data are defined as surface and upper air observations from island, ship and land stations plus weather observations from commercial and military aircraft (AIREPS). Computer plotted charts of 0000Z and 1200Z conventional data are produced daily for the surface, 700 mb, and 500 mb levels. A chart of upper air data is produced which utilizes 200 mb rawinsonde data and AIREPS above 29,000 ft within 6 hours of the 0000Z and 1200Z synoptic times.

c. AIRCRAFT RECONNAISSANCE:

Aircraft weather reconnaissance data are invaluable in the positioning of centers of developing systems and essential for the accurate determination of the eye/center, maximum intensity, minimum sea-level pressure and radius of significant winds exhibited by tropical cyclones. Winds and pressure height data at the 500 and/or 400 mb level, provided by reconnaissance aircraft while enroute to, or returning from, fix missions, is also used

to supplement the sparse data in the tropics and subtropics. These data are plotted on large-scale sectional charts for each mission flown. A comprehensive discussion of aircraft weather reconnaissance is presented in Chapter II.

d. SATELLITE RECONNAISSANCE:

Meteorological satellite data from the Defense Meteorological Satellite Program (DMSP) and the National Oceanic and Atmospheric Administration played a major role in the early detection and tracking of tropical cyclones in 1978. A discussion of this role is presented in Chapter II.

e. RADAR RECONNAISSANCE:

During 1978, as in recent years, land radar coverage was utilized extensively when available. Once a storm moved within the range of a land radar site, reports were usually received hourly. Use of radar during 1978 is discussed in Chapter II.

3. COMMUNICATIONS

a. FWC/JTWC currently has access to three primary communications circuits:

(1) The Automated Digital Network (AUTODIN) is used for dissemination of warnings and other related bulletins to Department of Defense installations. These messages are relayed for further transmission over U. S. Navy Fleet Broadcasts, U. S. Coast Guard CW (continuous wave morse code) and voice communications. Inbound message traffic for JTWC is received via AUTODIN addressed to FLEWEACEN GUAM.

(2) The Air Force Automated Weather Network (AWN) provides necessary weather data to JTWC through a dedicated circuit from the automated digital weather switch (ADWS) at Clark AB, R.P. The ADWS selects and routes the large volume of meteorological reports necessary to satisfy JTWC requirements for the right data at the right time. Weather bulletins prepared by JTWC are inserted into the AWN circuit by the Nimitz Hill Naval Telecommunications Center (NTCC) of the Naval Communications Area Master Station Western Pacific.

(3) The Naval Environmental Data Network (NEDN) connects FWC/JTWC with the computers at FNWC. FWC/JTWC is able to both receive environmental data from FNWC and access the computers directly to run various programs.

b. Besides providing forecasters with the ability to rapidly access computer products from FNWC, the NEDS has recently become the backbone of the FWC/JTWC communications system. AUTODIN and AWN message tapes can now be prepared by JTWC personnel for insertion into the AUTODIN and AWN circuits by the NTCC. The NEDS is also used by the TDO to request forecast aids which are

processed by the computers at FNWC Monterey and transmitted back to the TDO over the NEDN circuit.

4. ANALYSES

A composite surface/gradient level (3000 ft) manual analysis is accomplished on the 0000Z and 1200Z conventional data. Analysis of the wind field using streamlines is stressed for tropical and subtropical regions. Analysis of the pressure field is stressed for higher latitudes and in the vicinity of tropical cyclones.

Manual analysis of the 500 mb level is accomplished on the 0000Z and 1200Z data when significant tropical cyclones exist. Although the analysis of the 500 mb height field is stressed, analysis of the wind field to more clearly delineate steering currents is equally important.

A composite upper-tropospheric manual analysis, utilizing rawinsonde data from 300 mb through 100 mb, wind directions extracted from satellite data by Det 1, IWN and AIREPS (plus or minus 6 hours) at or above 29,000 feet is accomplished on 0000Z and 1200Z data daily. Wind and height data are used to arrive at a representative analysis of tropical cyclone outflow patterns, of steering currents and of areas that may indicate tropical cyclone intensity change. All charts are hand plotted over areas of tropical cyclone activity, to provide all available data as soon as possible, to the TDO, and then augmented by the computer plotted charts for the final analyses.

Additional sectional charts at intermediate synoptic times and auxiliary charts such as checkerboard diagrams and pressure change charts are also analyzed during periods of significant tropical cyclone activity.

5. FORECAST AIDS

a. CLIMATOLOGY:

Climatological publications utilized during the 1978 typhoon season include previous JTWC Annual Typhoon Reports and climatic publications from Fleet Weather Central, Guam, Naval Environmental Prediction Research Facility, Naval Postgraduate School, Air Weather Service, First Weather Wing and Chanute Technical Training Center, plus publications from other Air Force and Navy activities, various universities and foreign countries.

b. OBJECTIVE TECHNIQUES:

The following objective techniques were employed in tropical cyclone forecasting during 1978. A description of these techniques is presented in Chapter IV.

- (1) TYFN75
- (2) MOHATT 700/500
- (3) FCSTINST
- (4) 12 HR EXTRAPOLATION

(5) CLIMATOLOGY

(6) HPAC

(7) TROPICAL CYCLONE MODEL

(8) INJAH74

(9) CYCLOPS

(10) TYAN78

6. FORECASTING PROCEDURES

a. INITIALIZATION:

In the preparation of each warning, the actual surface location (fix) of the tropical cyclone eye/center just prior to (within three hours of) warning time is of prime importance. JTWC uses the Selective Reconnaissance Program (SRP) to levy an optimum mix of aircraft, satellite and radar resources to obtain fix information. When tropical cyclones are either poorly defined or the actual surface location cannot be determined, or when conflicting fix information is received, the "best estimate" of the surface location is subjectively determined from the analysis of all available data. If fix data is not available due to reconnaissance platform malfunctions or communication problems, synoptic data or extrapolation from previous fixes is used. The initial forecast (warning time) position is then obtained by extrapolation using the current fix and a "best track" of the cyclone movement to date.

b. TRACK FORECASTING:

An initial forecast track is developed based on the previous forecast and the objective techniques. This initial track is subjectively modified based on the following:

(1) The prospects for recurvature are evaluated for all westward and northward moving storms. This evaluation is based primarily on present and forecast position and amplitude of middle tropospheric mid-latitude troughs from the latest 500 mb analysis and numerical prognoses.

(2) Determination of steering level is partly influenced by maturity and vertical extent of the system. For mature storms located south of the 500 mb subtropical ridge, forecast changes in speed of movement are closely correlated with forecast changes in the intensity of the ridge. When steering currents are very weak, the tendency for cyclones to move northward due to their internal forces is an important consideration.

(3) The proximity of the tropical cyclone to other tropical cyclones is evaluated to determine if there is a possibility of Fujiwhara interaction.

(4) Over the 12- to 72-hr forecast spectrum; speed of movement during the early time frame is biased toward persistence (12 hr extrapolation) while that near the end of the time frame is biased towards objective techniques and climatology.

(5) A final check is made against climatology to ascertain the likelihood of the forecast track. If the forecast deviates greatly from climatology, the forecast rationale is reappraised and the track adjusted as necessary.

c. INTENSITY FORECASTING:

In forecasting intensity, heavy reliance is placed on aircraft reconnaissance reports, the Dvorak satellite interpretation model, wind and pressure data from ships and land stations in the vicinity of the cyclone, and the objective techniques. Additional considerations are the position and intensity of the tropical upper-tropospheric trough (TUTT), extent and intensity of upper-level outflow, sea surface temperature, terrain influences, speed of movement and proximity to an extratropical environment.

7. WARNINGS

Tropical cyclone warnings are issued when a definite closed circulation is evident and maximum sustained wind speeds are forecast to increase to 34 or more knots within 48 hours, or the cyclone is in such a position that life or property may be endangered within 72 hours. Warnings are also issued in other situations if it is determined that there is a need to alert military and civil interests to conditions which may become hazardous in a short period of time. Each tropical cyclone warning is numbered sequentially and includes the initial warning time, eye/center position, intensity, the radial extent of 30, 50 and 100 knot surface winds (when applicable), the levied fix position used, the instantaneous speed and direction of movement of the cyclone's surface center at warning time and the forecast information. The forecast intervals for all tropical cyclones, regardless of intensity, are 12-, 24-, 48- and 72-hr. Warnings within the JTWC Pacific area are issued within two hours of 0000Z, 0600Z, 1200Z and 1800Z with the constraint that two consecutive warnings may not be more than seven hours apart. Warnings in the JTWC Indian Ocean area are issued within two hours of 0800Z and 2000Z with the constraint that two consecutive warnings may not be more than fourteen hours apart. These variable warning times allow for maximum use of all available reconnaissance platforms and more effectively distribute the workload in multiple storm situations. If warnings are discontinued and a cyclone re-intensifies, warnings are numbered consecutively from the last warning issued. Warning forecast posi-

tions are verified against the corresponding post analysis "best track" positions. A summary of the verification results for 1978 is presented in Chapter IV.

8. PROGNOSTIC REASONING MESSAGE

In the Pacific Area, prognostic reasoning messages are transmitted based on the 0000Z and 1200Z warnings or whenever the previous reasoning is no longer valid. This plain language message is intended to provide field meteorologists with the reasoning behind the latest JTWC forecast. Prognostic reasoning messages are not prepared for tropical depressions nor for the cyclones in the Indian Ocean area.

For the 1978 season, JTWC included confidence statements for the 24 and 48-hour forecasts. The confidence values were percentage probabilities that the 24-hour forecast position error would be less than 100 nm and less than 150 nm, respectively; and that the 48-hour error would be less than 200 nm and less than 300 nm, respectively. These probabilities were based on objective data from error analysis studies of past cyclones and were a function of latitude, longitude, storm intensity and organization. The forecaster added objective data based on the subjective analysis of the synoptic situation and the variance in the objective forecast aids available.

Prognostic reasoning information applicable to all customers is provided in the remarks section of warnings when significant changes are made or when deemed appropriate.

9. SIGNIFICANT TROPICAL WEATHER ADVISORY

This plain language message, summarizing significant weather in the entire JTWC area of responsibility, is issued by 0600Z daily. It contains a detailed, non-technical description of all significant tropical disturbances and the JTWC evaluation of potential for significant tropical cyclone development within the 24-hour forecast period.

10. TROPICAL CYCLONE FORMATION ALERT

Alerts are issued whenever interpretation of satellite and other meteorological data indicates significant tropical cyclone formation is likely. These alerts will specify a valid period not to exceed 24 hours and must either be cancelled, reissued or superseded by a warning prior to expiration of the valid period.

CHAPTER II - RECONNAISSANCE & FIXES

1. GENERAL

The Joint Typhoon Warning Center depends on reconnaissance to provide necessary, accurate and timely meteorological information in support of each warning. JTWC relies primarily on three sources of reconnaissance: aircraft, satellite and radar. Optimum utilization of all available reconnaissance resources is obtained through use of the Selective Reconnaissance Program (SRP) whereby various factors are considered in selecting a specific reconnaissance platform for each warning. These factors include: cyclone location and intensity, reconnaissance platform capabilities and limitations, and the cyclone's threat to life/property afloat and ashore. A summary of reconnaissance fixes received during 1978 is included in Section 6.

2. RECONNAISSANCE AVAILABILITY

a. Aircraft:

Aircraft weather reconnaissance is performed in the JTWC area of responsibility by the 54th Weather Reconnaissance Squadron (54 WRS). The squadron, presently equipped with six WC-130 aircraft, is located at Andersen Air Force Base, Guam. From July through October, augmentation by the 53rd WRS at Keesler Air Force Base, Mississippi brings the total number of available aircraft to nine. The JTWC reconnaissance requirements are provided daily throughout the year to the Tropical Cyclone Aircraft Reconnaissance Coordinator (TCARC). These requirements include area(s) to be investigated, tropical cyclone(s) to be fixed, fix times and forecast positions of fixes. The following priorities are utilized in acquiring meteorological data from aircraft, satellite and land-based radar in accordance with CINCPACINST 3140.1N:

"(1) Investigative flights and vortex or center fixes for each scheduled warning in the Pacific area of responsibility. One aircraft fix per day of each cyclone of tropical storm or typhoon intensity is considered the minimum desired.

(2) Center or vortex fixes for each scheduled warning of tropical cyclones in the Indian Ocean Area of responsibility.

(3) Supplementary fixes.

(4) Synoptic data acquisition."

As in previous years, aircraft reconnaissance provided direct measurements of height, temperature, flight-level winds, sea level pressure, estimated surface winds (when observable) and numerous additional parameters. The meteorological data are gathered by the Aerial Reconnaissance Weather Officers

(ARWO) and dropsonde operators of Detachment 4, Hq AWS who crew with the 54th. These data provide the Typhoon Duty Officer (TDO) indications of changing cyclone characteristics, radius of cyclone associated winds, and present cyclone position and intensity. Another important aspect of this data is its availability for research in tropical cyclone analysis and forecasting. Aircraft reconnaissance will become even more important in years to come when high-resolution tropical cyclone dynamic steering programs will require a dense input of wind and temperature data.

b. Satellite

Satellite fixes from USAF ground sites and USN ships provide day and night coverage in the JTWC area of responsibility. Interpretation of this satellite imagery provides cyclone positions and estimates of storm intensities through the Dvorak technique (for daytime passes).

Detachment 1, 1st Weather Wing is the primary fix site for the western North Pacific. Both DMSP and NOAA data are received and processed. DMSP fix positions received at JTWC from the Air Force Global Weather Central (AFGWC), Offutt Air Force Base, Nebraska were the major source of satellite data for the Indian Ocean. GOES fixes were also provided by the National Environmental Satellite Service, Honolulu, Hawaii for tropical cyclones near the dateline.

c. Radar

Land radar provides positioning data on well developed cyclones when in proximity (usually within 175 nm of the radar site) of the Republic of the Philippines, Taiwan, Hong Kong, Japan, the Republic of Korea, Kwajalein, and Guam.

3. AIRCRAFT RECONNAISSANCE SUMMARY

During the 1978 tropical cyclone season, JTWC levied 290 six-hourly vortex fixes (Table 2-1). New storm tracks developed by Det 4, AWS and JTWC increased the number of supplemental fixes from 4 in 1977 to 149 in 1978. These tracks require reconnaissance aircraft to penetrate a tropical cyclone twice on a one-fix mission and three times on a two-fix mission; the extra fix is termed supplemental. In addition to vortex fixes, 38 investigative missions were levied (the 1976-1978 average is 38 invests). Of 1978's 32 tropical cyclones, investigative missions were not flown on nine.

Reconnaissance effectiveness is summarized in Table 2-1 using the criteria as set forth in CINCPACINST 3140.1N.

TABLE 2-1. AIRCRAFT RECONNAISSANCE EFFECTIVENESS

EFFECTIVENESS	NUMBER OF FIXES	PERCENT
COMPLETED ON TIME	272	93.8
EARLY	6	2.1
LATE	10	3.4
MISSSED	2	0.7
TOTAL	290	100.0

LEVIED VS. MISSED FIXES			
	LEVIED	MISSED	PERCENT
AVERAGE 1965-1970	507	10	2.0
1971	802	61	7.6
1972	624	126	20.2
1973	227	13	5.7
1974	358	30	8.4
1975	217	7	3.2
1976	317	11	3.5
1977	203	3	1.5
1978	290	2	0.7

4. SATELLITE RECONNAISSANCE SUMMARY

The Air Force provides satellite reconnaissance support to JTWC using meteorological data from DMSP polar orbiting meteorological satellites.

A network of tactical DMSP sites at Nimitz Hill, Guam; Clark AB, Philippines; Kadena AB, Japan; Osan AB, Korea; and Hickam AFB, Hawaii provides direct readout coverage north of the equator from the dateline west into the South China Sea. In February 1977, the Guam site was modified to acquire very high resolution data from the National Oceanic and Atmospheric Administration (NOAA) satellites. The Hawaii site was modified soon thereafter.

The Air Force Global Weather Central (AFGWC) at Offutt AFB, Nebraska, using stored data readout, provides satellite reconnaissance over the Indian Ocean and backup for the tactical sites in WESTPAC. Det 1, 1WW colocated with the JTWC, operates the network tasking appropriate sites for tropical cyclone position reports.

Satellite positions are assigned Position Code Numbers (PCN's) depending on the availability of geography for precise gridding and the state of the tropical cyclone's circulation (Table 2-2). Estimates of tropical cyclone intensity are obtained from visual data using the Dvorak technique (NOAA Technical Memorandum NESS 45 and later refinements).

TABLE 2-2. POSITION CODE NUMBERS

PCN	METHOD OF CENTER DETERMINATION/GRIDDING
1	EYE/GEOGRAPHY
2	EYE/EPHEMERIS
3	WELL DEFINED CC/GEOGRAPHY
4	WELL DEFINED CC/EPHEMERIS
5	POORLY DEFINED CC/GEOGRAPHY
6	POORLY DEFINED CC/EPHEMERIS

CC=Circulation Center

Availability of satellite data enabled JTWC to effectively use satellite reconnaissance through the Selective Reconnaissance Program (SRP). During the 1978 season over 1900 satellite fixes were made on unnumbered as well as numbered tropical cyclones in WESTPAC.

By using a dual-site tasking concept which requires at least two separate DMSP sites to make each JTWC levied tropical cyclone fix, satellite reconnaissance reliability in meeting JTWC's fix requirements was 96%. Most missed fixes were due to an unreliable late morning/late evening satellite. Because of this satellite's unreliability, aircraft reconnaissance routinely supported 0600Z and 1800Z warnings with radar and NOAA-5 satellite data also being used on occasion. Use of the NOAA-5 satellite for fixing tropical cyclones ended in September 1978 when the satellite became too unstable for accurate positioning.

A comparison of satellite derived positions and the JTWC Best Track positions is included in Table 2-3. The relative accuracies of satellite positions can be obtained from this table.

TABLE 2-3. MEAN DEVIATIONS (NM) OF DMSP DERIVED TROPICAL CYCLONE POSITIONS FROM JTWC BEST TRACK POSITIONS, 1974-1978 (ALL SITES). NUMBER OF CASES SHOWN IN PARENTHESIS.

PCN	1974 (ALL SITES)	1975 (ALL SITES)	1976 (ALL SITES)	1977 (ALL SITES)	1978 (ALL SITES)
1	13.6 (224)	11.8 (214)	12.4 (131)	15.7 (134)	13.8 (189)
2	17.4 (37)	20.4 (35)	20.1 (124)	19.1 (47)	16.0 (95)
3	20.1 (422)	21.2 (271)	21.7 (161)	22.4 (141)	21.9 (353)
4	23.9 (70)	22.4 (50)	29.3 (152)	30.0 (75)	21.8 (156)
5	35.4 (342)	34.2 (323)	40.4 (247)	37.7 (357)	38.1 (571)
6	49.4 (108)	44.7 (71)	49.0 (153)	40.9 (247)	50.5 (370)
1&2	14.2 (261)	13.0 (249)	16.1 (255)	16.6 (181)	14.6 (284)
3&4	20.6 (492)	21.4 (321)	25.4 (313)	25.0 (216)	21.9 (509)
5&6	38.8 (450)	36.1 (394)	43.7 (400)	39.0 (604)	43.0 (941)

Satellite derived fixes were also obtained from: USN ships equipped for DMSP or TIROS-N/NOAA APT direct readout; the National Environmental Satellite Service using NOAA and GOES data; and Fleet Weather Facility (FLEWEAFAC), Suitland, Maryland using stored NOAA and DMSP data. This information was invaluable to the warning service. Since these were secondary sources, they were not included in statistics.

5. RADAR RECONNAISSANCE SUMMARY

Fifteen of the 32 significant tropical cyclones occurring over the western North Pacific during 1978 passed within range of land based radars with sufficient cloud pattern organization to be fixed. The hourly and oftentimes, half-hourly land radar fixes that were obtained and transmitted to JTWC totaled 848. A percentage breakdown by country is as follows: Japan-Ryukyu Islands 62%, Republic of the Philippines 18%, Hong Kong 8%, Guam (U.S.) 7%, and Taiwan 4%.

The WMO radar code defines three categories of accuracy: good (within 10 km (5.4 nm)), fair (within 10-30 km (5.4-16.2 nm)) and poor (within 30-50 km (16.2-27 nm)). This year 308 radar fixes were coded in this manner; 49% were good, 20% fair and 31% poor. Compared to the JTWC best track, the mean vector deviation for land radar sites was 13 nm (24 km).

Of the 15 tropical cyclones which were monitored with radar, 10 were typhoons (Olive, Virginia, Wendy, Carmen, Elaine, Faye, Irma, Lola, Ora and Rita). These 10 typhoons accounted for 74% of all radar fixes received this season. Excellent support through timely and accurate radar fix positioning allowed JTWC to track and forecast tropical cyclone movement through even the most difficult and erratic tracks.

The 54 WRS made four radar center fixes from their WC-130 aircraft when actual penetration was restricted. One aircraft radar fix of TC 20-78 when over the Arabian Sea was relayed to JTWC from Diego Garcia. No ship radar center fixes were received during 1978.

6. TROPICAL CYCLONE FIX DATA

A total of 317 fixes on 32 northwest Pacific tropical cyclones and 117 fixes on four northern Indian Ocean tropical cyclones were received at JTWC. Table 2-4, Fix Platform Summary, delineates the number of fixes per platform for each individual tropical cyclone. Season totals and percentages are also indicated.

Annex B is an output of program PRNTFIX which lists individual fixes sequentially for each tropical cyclone. Fix data is divided into three categories; Satellite, Aircraft and Radar. Those fixes labeled with an asterisk (*) were determined to be unrepresentative of the surface center and were not used in determining the best tracks. Within each category, the first three columns are as follows:

FIX NO. - Sequential fix number

TABLE 2-4. FIX PLATFORM SUMMARY

AIRCRAFT	FIX PLATFORM					TOTAL
	DMSP	NOAA-5	GOES	LAND RADAR	AIRCF. RADAR	
WESTERN PACIFIC						
TS NADINE	9	29	24	1	-	45
TS OLIVE	25	66	23	-	17	131
TS POLLY	15	58	12	-	124	209
TS ROSE	7	25	7	-	-	39
TS SALLY	-	21	6	-	-	28
TS VERA	29	84	18	-	-	111
TS VIRGINIA	36	85	6	-	42	169
TS WENDY	26	130	7	-	100	263
TS AGNES	-	63	6	-	50	119
TS BONNIE	-	15	4	-	-	19
TS CARMEN	22	164	12	-	125	263
TS DELLA	6	22	2	-	9	39
TD 14	6	24	6	-	2	36
TY ELAINE	12	38	14	-	24	88
TY FAYE	45	87	6	-	8	147
TS GLORIA	7	36	1	-	-	44
TS HESTER	1	31	-	-	-	32
TY IRMA	7	41	-	-	72	122
TY JUDY	14	50	-	-	-	44
TD 7	12	50	-	-	-	62
TY LOLA	17	90	-	-	29	136
TY MAMIE	12	38	-	-	-	50
TS NINA	16	74	-	-	34	124
TS ORA	18	59	-	-	96	173
TD 26	-	17	-	-	-	17
TD 27	2	28	-	-	-	30
TY PHILLIS	8	58	-	-	-	67
ST RITA	43	110	3	5	115	276
TS NESS	17	42	-	-	-	59
TD 12	-	36	-	-	-	36
TY VIOLA	22	70	-	-	-	92
TS WINNIE	12	28	-	-	-	25
TOTAL	446	1709	157	8	848	3172
% OF TOTAL NO. OF FIXES	14.1	53.9	4.9	.3	26.7	100
		DMSP	TIROS-N		AIRCF. RADAR	TOTAL
INDIAN OCEAN						
TC 18-78	-	-	-	-	-	21
TC 19-78	-	-	-	-	-	13
TC 20-78	-	-	-	-	1	37
TC 21-78	-	-	-	-	6	46
TOTAL	104	12	-	1	-	117
% OF TOTAL NO. OF FIXES	86.9	10.2	.9	-	-	100

* FIX POSITIONS QUOTED WERE ONLY THOSE WHERE A SPECIFIC LATITUDE AND LONGITUDE WERE GIVEN.

TIME (Z) - GMT time in day, hours and minutes

FIX POSITION - Latitude and longitude to the nearest tenth of a degree

Depending upon the category, the remainder of the format varies as follows:

a. Satellite

(1) ACCRY - Position Code Number (PCN) (See Sec. 5). The accuracy for FWF Suitland fix positions are given as confidence numbers (CONF) (See Table 2-5 for details).

(2) DVORAK CODE - Intensity evaluation and trend utilizing DMSP visual satellite data.

FOR TROPICAL
TODAY'S T-NUMBER
CURRENT INTENSITY
NUMBER
INDICATION
OF ONGOING
CHANGE
PLUS
T () / () MINUS / S () / () hrs
D PAST CHANGE
**AMOUNT OF PAST
CHANGE**
W LEAVE
**HOURS SINCE
PREVIOUS OBS.**

EXAMPLE: T5/6 MINUS/W1.5/24hrs.

(For specifics refer to NOAA TM; NESS-45)

TABLE 2-5. CONFIDENCE (CONF) NUMBERS AS A FUNCTION OF DVORAK T NUMBER AND RADIUS OF 90% PROBABILITY AREA (NM).

TROPICAL CYCLONE INTENSITY	CONF (1)	CONF (2)	CONF (3)
T1.5	60	120	170
T2.0	60	120	170
T2.5	60	120	170
T3.0	50	100	150
T3.5	45	90	140
T4.0	45	90	140
T4.5	45	90	140
T5.0	40	90	130
T5.5	40	80	130
T6.0	40	80	130
T6.5	30	70	120
T7.0	30	70	120
T7.5	30	60	100
T8.0	30	60	100

(3) SAT - Specific satellite used for fix position (DMSP 35, 36 or 37, NOAA-5, TIROS-N, or Geostationary Operational Environmental Satellite (GOES)).

(4) COMMENTS - For explanation of abbreviations see Appendix.

(5) SITE - ICAO call sign of the specific satellite tracking station.

b. Radar

(1) RADAR - Specific type of platform utilized for fix (land radar site, aircraft or ship).

(2) ACCRY - Accuracy of fix position (good, fair or poor) as given in the WMO ground radar weather observation code (FM20-V).

(3) EYE SHAPE - Geometrical representation of the eye given in plain language (Circular, Elliptical, etc.).

(4) EYE DIAM - Diameter of eye given in nautical miles.

(5) RADOB CODE - Taken directly from WMO ground weather radar observation code FM20-V. First group specifies the vortex parameters while the second group describes the movement of the vortex center.

(6) RADAR POSITION - Latitude and longitude of tracking station given in tenths of a degree.

(7) SITE - WMO station number of the specific tracking station.

c. Aircraft

(1) FLT LVL - The constant pressure surface level, in mb, maintained during the penetration. 700 mb is the normal level flown in developed cyclones due to turbulence factors with low level missions flown at 1500 ft.

(2) MIN HGT - Minimum height of the 700 mb pressure surface within the vortex recorded in meters.

(3) OBS MSLP - The minimum observed sea level pressure on a 700 mb fix mission is obtained by applying the minimum 700 mb height to the following regression equation:

$$SLP \text{ (MB)} = .115 \text{ (700 mb HGT [M])} + 645$$

This relationship is accurate within ± 3 mb in most cases. However, if the 700 mb center and the surface center are not vertically aligned, the minimum sea level pressure will be erroneously high. If the surface center can be visually detected (e.g., in the eye), the minimum sea level pressure is obtained by a dropsonde released above the surface vortex center.

If the fix is made at the 1500 foot level, the sea level pressure is extrapolated from that level.

(4) MAX-SFC-WND - The maximum surface wind (knots) is an estimate made by the ARWO based on sea state. This observation is limited to the region of the flight path, and may not be representative of the entire cyclone. Availability of data is also dependent upon the absence of undercast conditions and the presence of adequate illumination. The positions of the maximum flight level wind and the maximum observed surface wind do not necessarily coincide.

(5) MAX-FLT-LVL-WND - Wind speed (knots) at flight level is measured by the AN/APN 147 doppler radar system aboard the WC-130 aircraft. Values entered in this category represent the maximum wind measured prior to obtaining a scheduled fix. This measurement may not represent the maximum flight level wind associated with the tropical cyclone because the aircraft only samples those portions of the tropical cyclone along the flight path. In many instances the flight path may be through the weak sector of the cyclone. In areas of heavy rainfall, the doppler radar may track energy reflected from precipitation rather than from the sea surface; thus preventing accurate wind speed measurement. In obvious cases such erroneous wind data will not be reported. In addition, the doppler radar system on the WC-130 restricts wind measurements to drift angles less than or equal to 27 degrees if the wind is normal to the aircraft heading.

(6) ACCRY - Fix position accuracy. Both navigational (OMEGA and LORAN) and meteorological (by the ARWO) estimates are given in nautical miles.

(7) EYE SHAPE - Geometrical representation of the eye based on the aircraft radar presentation. Reported only if center is 50% or more surrounded by wall cloud.

(8) EYE DIAM/ORIENTATION - Diameter of the eye in nautical miles. In case of elliptical eye, the orientation describes the nautical mile lengths of the major and minor axes.

CHAPTER III - SUMMARY OF TROPICAL CYCLONES

1. WESTERN NORTH PACIFIC TROPICAL CYCLONES

During 1978, the western North Pacific experienced a near-climatological average with a total of 32 cyclones (Table 3-1; cyclones 10 and 30 occurred in the central North Pacific area). Four, significant tropical cyclones never developed beyond tropical depression (TD) stage. Of the 2° that became tropical storms (TS), 15 developed to typhoon (TY) stage only one of which reached the 130 kt (67 m/sec) intensity necessary to be classified as a super typhoon (ST).

Even though the 1978 season had a near-average number of cyclones (Tables 3-2 and 3-3), it was a season full of surprises. Ten of the tropical storms and typhoons exhibited erratic movement. Typhoon Carmen remained quasi-stationary for three days over the East China Sea. Typhoon Faye executed a large anticyclonic loop and subsequently underwent explosive deepening as the surface central pressure fell 18 mb in six hours. The most ill-behaved typhoon of the season, Trix, truly lived up to her name. As Tropical Storm Kit crossed Luzon, the surface circulation dissipated while the mid- and upper-level circulations continued across and eventually became aligned with a secondary or "lee-side" low that had formed

west of Luzon. Tropical Storms Hester and Phyllis attained post-recurvature speeds of 40 kt (74 km/hr) and 50 kt (93 km/hr), respectively, in extratropical transition. Typhoons Virginia and Mamie were unusually compact and could, thus, be termed midget typhoons. Virginia also traveled the farthest north (47N) while retaining tropical characteristics. Having first been detected in the central Pacific near 175W, Super Typhoon Rita traveled a record distance for the season (4142 nm (7671 km)), and was second overall only to Typhoon Sarah of 1976 (4499 nm (8332 km)).

During 1978, 32 Tropical Cyclone Formation Alerts were issued. Of these, 27 (84%) developed into significant tropical cyclones (Table 3-4). Five tropical cyclones were immediately placed into warning status without first issuing Formation Alerts due to their rapid development.

During 1978, there were 715 warnings issued for the WESTPAC region with a total of 131 "warning days" (Table 3-5). On 46 of these 131 days, two or more cyclones existed and on 16 days three cyclones were in existence.

TABLE 3-1.

WESTERN NORTH PACIFIC

1978 SIGNIFICANT TROPICAL CYCLONES

CYCLONE	TYPE	NAME	PRD OF WARNING	CALENDAR DAYS OF WARNING	MAX SPC	MIN	NO. OF WARNINGS		DISTANCE TRAVELED
							TOTAL	AS TY	
01	TS	NADINE	08 JAN-13 JAN	6	60	973	21		1340
02	TY	OLIVE	18 APR-26 APR	9	85	955	36	14	2669
03	TS	POLLY	16 JUN-20 JUN	5	50	985	16		788
04	TS	ROSE	23 JUN-24 JUN	2	40	993	7		352
05	TS	SHIRLEY	30 JUN-30 JUN	1	35	990	3		161
06	TY	TRIX	13 JUL-22 JUL	10	70	967	38	9	2326
07	TY	VIRGINIA	23 JUL-02 AUG	11	70	972	43	31	2052
08	TY	WENDY	24 JUL-03 AUG	11	80	962	42	27	1372
09	TS	AGNES	24 JUL-30 JUL	7	50	985	22		667
11	TS	BONNIE	10 AUG-12 AUG	3	40	984	9		481
12	TY	CARMEN	11 AUG-20 AUG	10	80	961	37	16	2076
13	TS	DELLA	11 AUG-13 AUG	3	45	984	10		774
14	TD	TD-14	19 AUG-20 AUG	2	30	991	6		556
15	TY	ELAINE	23 AUG-28 AUG	6	65	974	20		1036
16	TY	FAYE	28 AUG-07 SEP	11	105	936	44	17	2127
17	TS	GLORIA	29 AUG-01 SEP	4	40	990	12		553
18	TS	HESTER	30 AUG-01 SEP	3	50	987	11		851
19	TY	IRMA	12 SEP-15 SEP	4	65	972	15	3	854
20	TY	JUDY	13 SEP-17 SEP	5	90	950	18	10	1296
21	TS	KIT	21 SEP-26 SEP	6	50	992	21		1382
22	TY	LOLA	24 SEP-03 OCT	10	75	963	35	13	1672
23	TY	MAMIE	30 SEP-04 OCT	5	70	963	19	3	1578
24	TS	NINA	08 OCT-17 OCT	10	60	981	37		1299
25	TY	ORA	10 OCT-15 OCT	6	85	944	22	7	1370
26	TD	TD-26	11 OCT-12 OCT	2	30	998	7		519
27	TD	TD-27	15 OCT-16 OCT	2	20	1003	6		155
28	TY	PHYLLIS	15 OCT-22 OCT	8	95	953	30	17	1687
29	ST	RITA	17 OCT-30 OCT	14	155	878	51	34	4142
31	TS	TESS	01 NOV-07 NOV	7	60	975	22		1346
32	TD	TD-32	17 NOV-20 NOV	4	25	1002	12		296
33	TY	VIOLA	17 NOV-24 NOV	8	125	911	29	15	2042
34	TS	WINNIE	27 NOV-30 NOV	4	55	977	14		1287
1978 TOTALS				131**			715	216	

** OVERLAPPING DAYS INCLUDED ONLY ONCE IN SUM

JWLC

TABLE 3-2.

FREQUENCY OF TYPHOONS BY MONTH AND YEAR

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
AVERAGE (1945-58)	0.4	0.1	0.3	0.4	0.7	1.1	2.0	2.9	3.2	2.4	2.0	0.9	16.3
1959	0	0	0	1	0	0	1	5	3	3	2	2	17
1960	0	0	0	1	0	2	2	8	0	4	1	1	19
1961	0	0	1	0	2	1	3	3	5	3	1	1	20
1962	0	0	0	1	2	0	5	7	2	4	3	0	24
1963	0	0	0	1	1	2	3	3	3	4	0	2	19
1964	0	0	0	0	2	2	6	3	5	3	4	1	26
1965	1	0	0	1	2	2	4	3	5	2	1	0	21
1966	0	0	0	1	2	1	3	6	4	2	0	1	20
1967	0	0	1	1	0	1	3	4	4	3	3	0	20
1968	0	0	0	1	1	1	1	4	3	5	4	0	20
1969	1	0	0	1	0	0	2	3	2	3	1	0	13
1970	0	1	0	0	0	1	0	4	2	3	1	0	12
1971	0	0	0	3	1	2	6	3	5	3	1	0	24
1972	1	0	0	0	1	1	4	4	3	4	2	2	22
1973	0	0	0	0	0	0	4	2	2	4	0	0	12
1974	0	0	0	0	1	2	1	2	3	4	2	0	14
1975	1	0	0	0	0	0	1	3	4	3	2	0	15
1976	1	0	0	1	2	2	2	1	4	1	1	0	15
1977	0	0	0	0	0	0	3	0	2	3	2	1	11
1978	0	0	0	1	0	0	3	2	4	3	2	0	15
AVERAGE (1959-78)	0.25	0.05	0.10	0.70	0.85	0.95	2.85	3.55	3.25	3.20	1.65	0.55	17.95

JTWC

TABLE 3-3.

FREQUENCY OF TROPICAL STORMS AND TYPHOONS BY MONTH AND YEAR

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
AVERAGE (1945-58)	0.4	0.1	0.4	0.5	0.8	1.3	3.0	3.9	4.1	3.3	2.7	1.1	21.6
1959	0	1	1	1	0	0	3	6	6	4	2	2	26
1960	0	0	0	1	1	3	3	10	3	4	1	1	27
1961	1	1	1	1	3	2	5	4	6	5	1	1	31
1962	0	1	0	1	2	0	6	7	3	5	3	2	30
1963	0	0	0	1	1	3	4	3	5	5	0	3	25
1964	0	0	0	0	2	2	7	9	7	6	6	1	40
1965	2	2	1	1	2	3	5	6	7	2	2	1	34
1966	0	0	0	1	2	1	5	8	7	3	2	1	30
1967	1	0	2	1	1	1	6	8	7	4	3	1	35
1968	0	0	0	1	1	1	3	8	3	6	4	0	27
1969	1	0	1	1	0	0	3	4	3	3	2	1	19
1970	0	1	0	0	0	2	2	6	4	5	4	0	24
1971	1	0	1	3	4	2	8	4	6	4	2	0	35
1972	1	0	0	0	1	3	6	5	4	5	2	3	30
1973	0	0	0	0	0	0	7	5	2	4	3	0	21
1974	1	0	1	1	1	4	4	5	5	4	4	2	32
1975	1	0	0	0	0	0	2	4	5	5	3	0	20
1976	1	1	0	2	2	2	4	4	5	1	1	2	25
1977	0	0	1	0	0	1	4	1	5	4	2	1	19
1978	1	0	0	1	0	3	4	7	5	4	3	0	28
AVERAGE (1959-78)	0.55	0.35	0.45	0.85	1.15	1.65	4.55	5.70	4.90	4.15	2.50	1.10	27.90

JTWC

TABLE 3-4.

FORMATION ALERT SUMMARY

WESTERN NORTH PACIFIC

YEAR	NUMBER OF ALERT SYSTEMS	ALERT SYSTEMS WHICH BECAME NUMBERED TROPICAL CYCLONES	TOTAL NUMBERED TROPICAL CYCLONES	DEVELOPMENT RATE
1972	41	29	32	71%
1973	26	22	23	85%
1974	35	30	36	86%
1975	34	25	25	74%
1976	34	25	25	74%
1977	26	20	21	77%
1978	32	27	32	84%

MONTHLY DISTRIBUTION

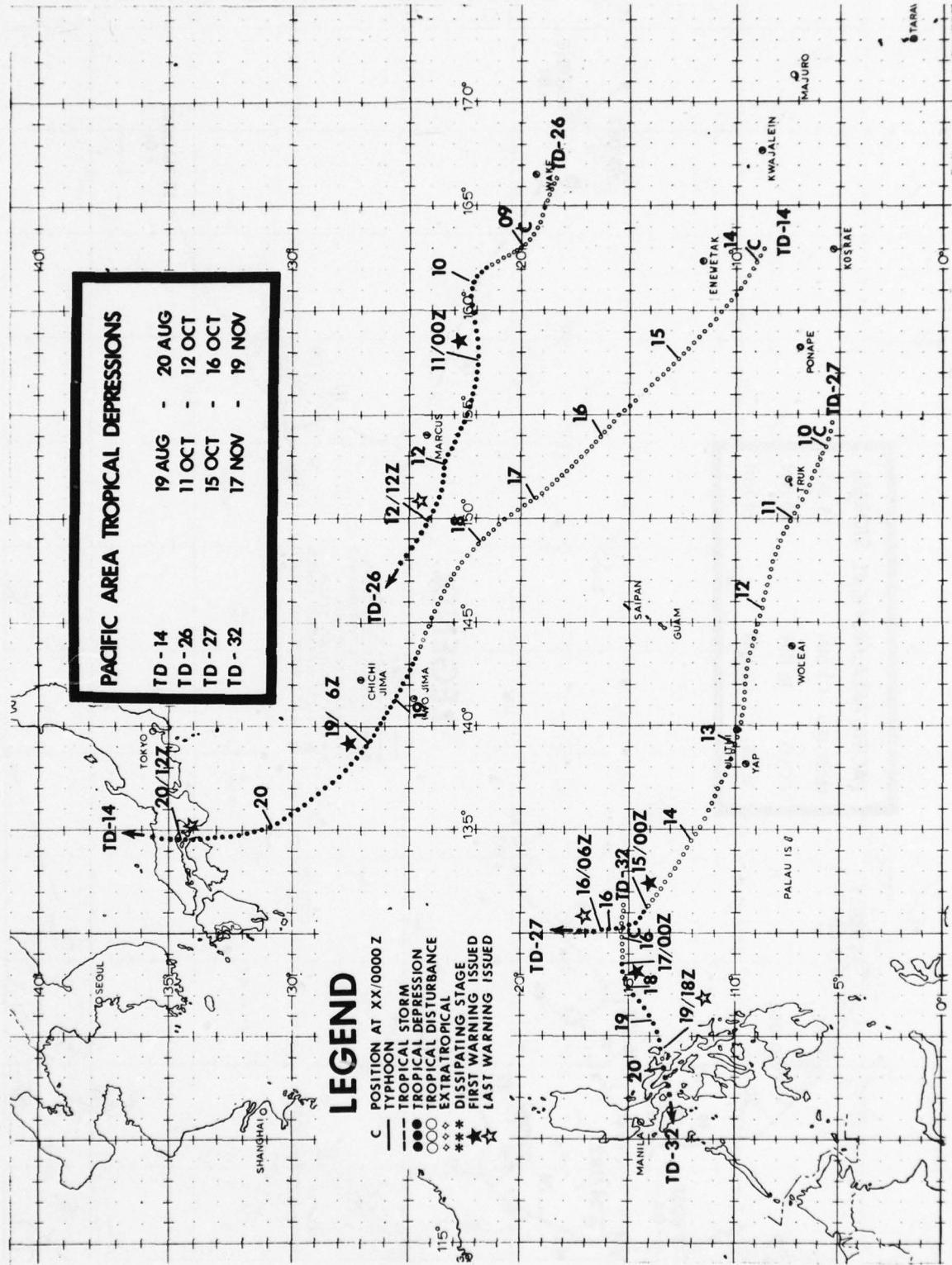
FORMATION ALERTS	J	F	M	A	M	J	J	A	S	O	N	D
	1	0	0	1	0	4	3	7	5	8	3	0

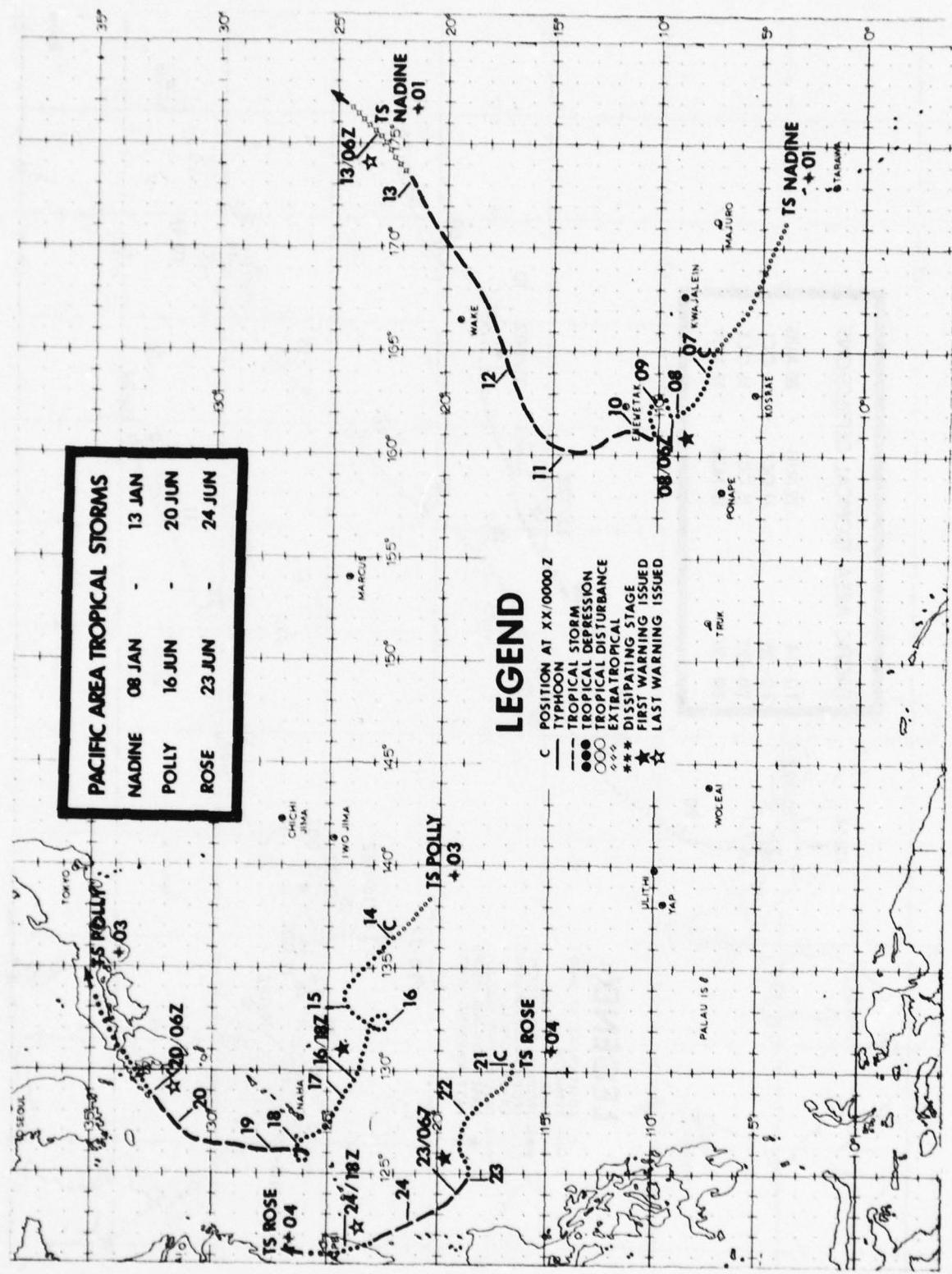
TABLE 3-5.

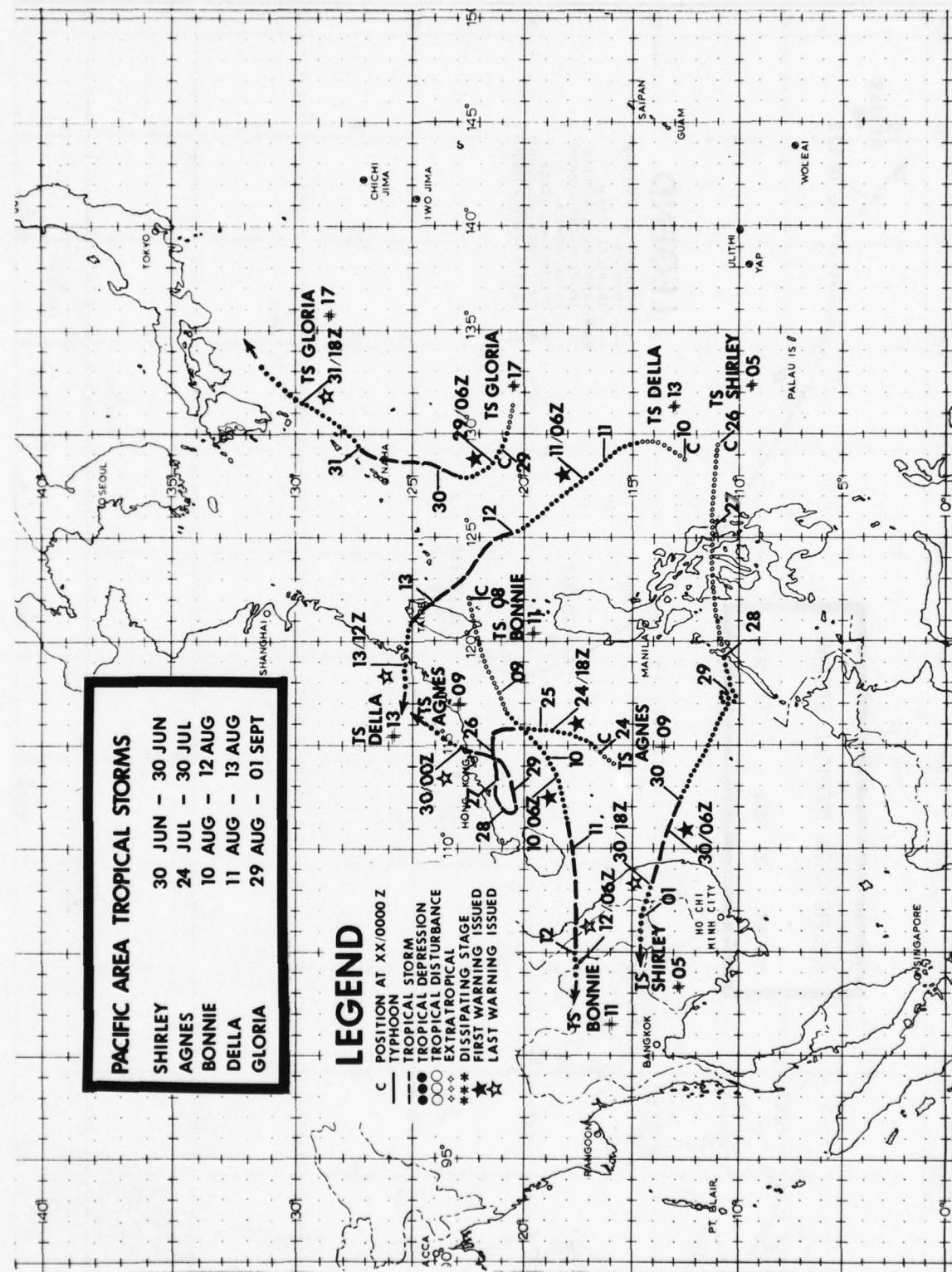
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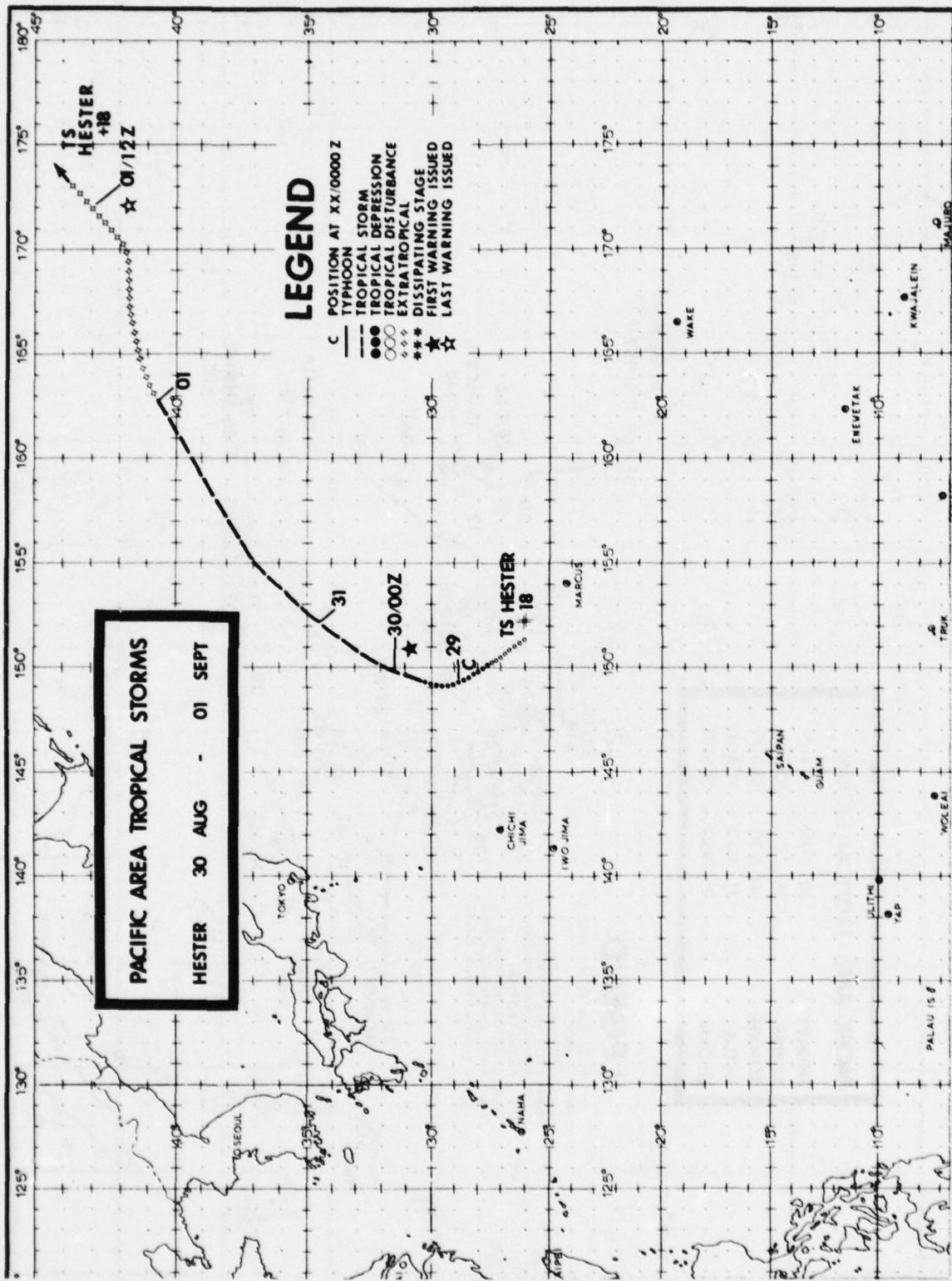
WESTERN NORTH PACIFIC

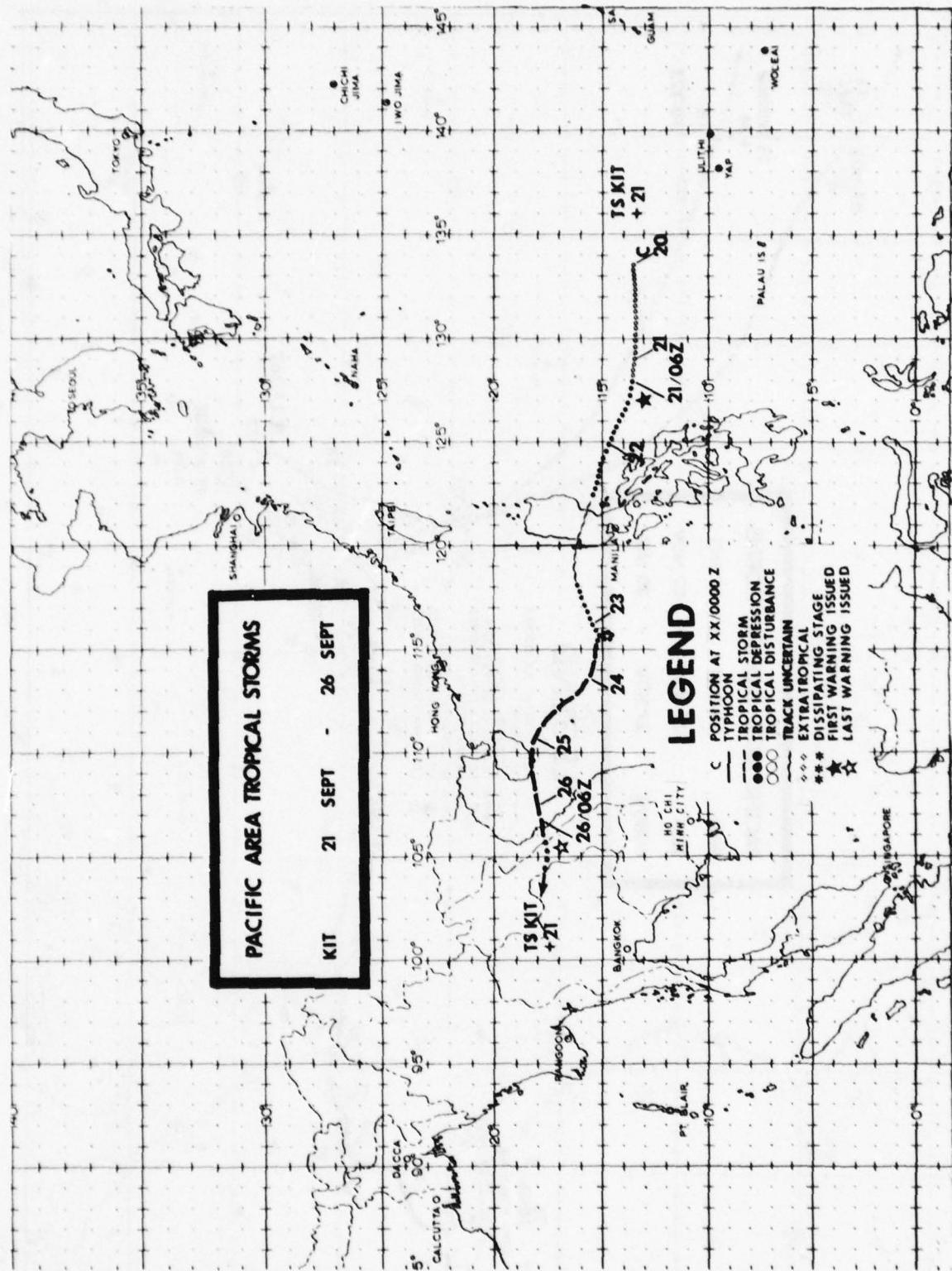
	1978	AVERAGE 1959-1977
TOTAL NUMBER OF WARNINGS	715	669
NUMBER OF WARNING DAYS	131	141
NUMBER OF WARNING DAYS WITH 2 OR MORE CYCLONES	46	46
NUMBER OF WARNING DAYS WITH 3 OR MORE CYCLONES	16	9
TROPICAL DEPRESSIONS	4	5
TROPICAL STORMS	13	11
TYPHOONS	15	19
TOTAL TROPICAL CYCLONES	32	35

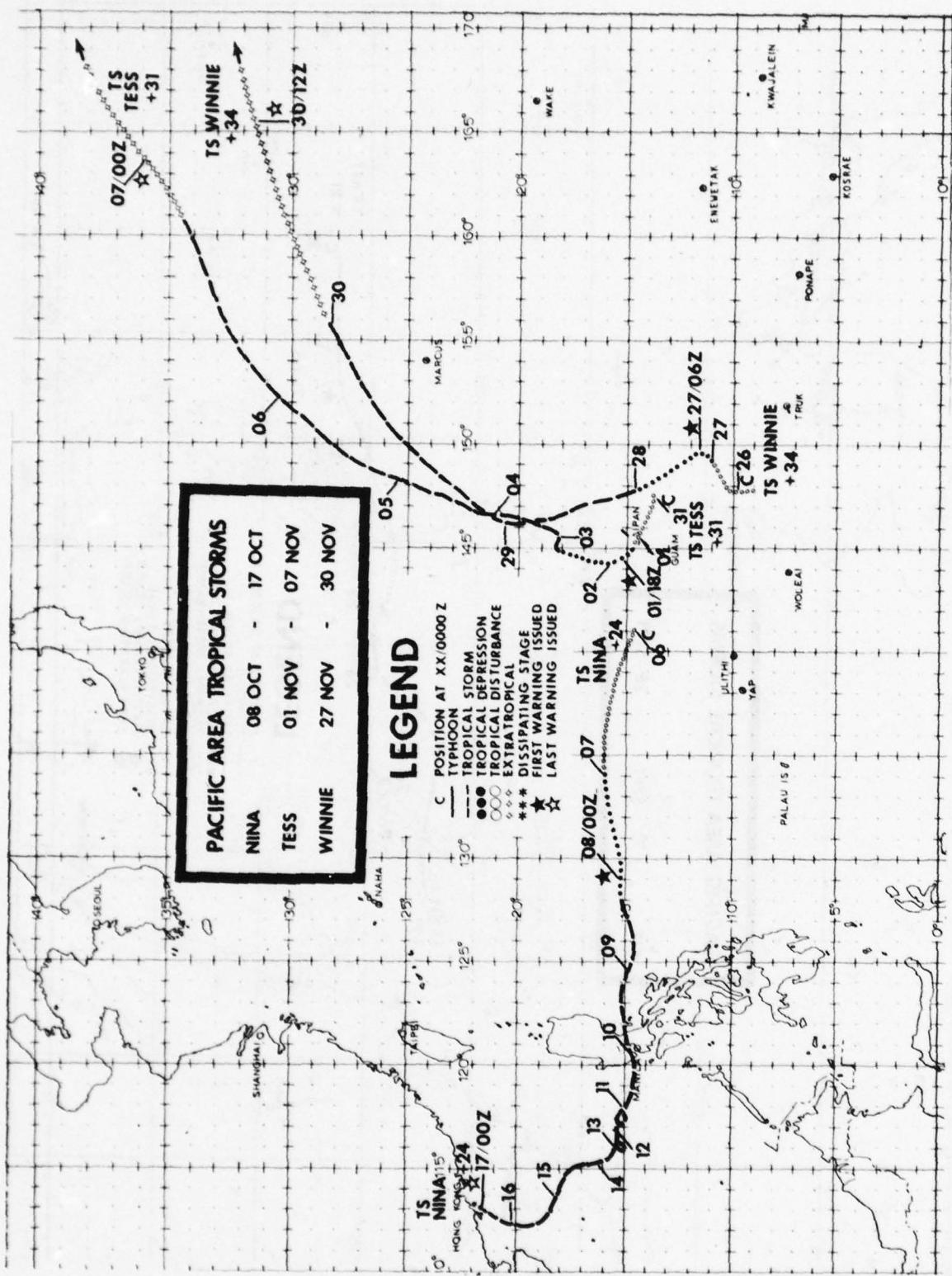


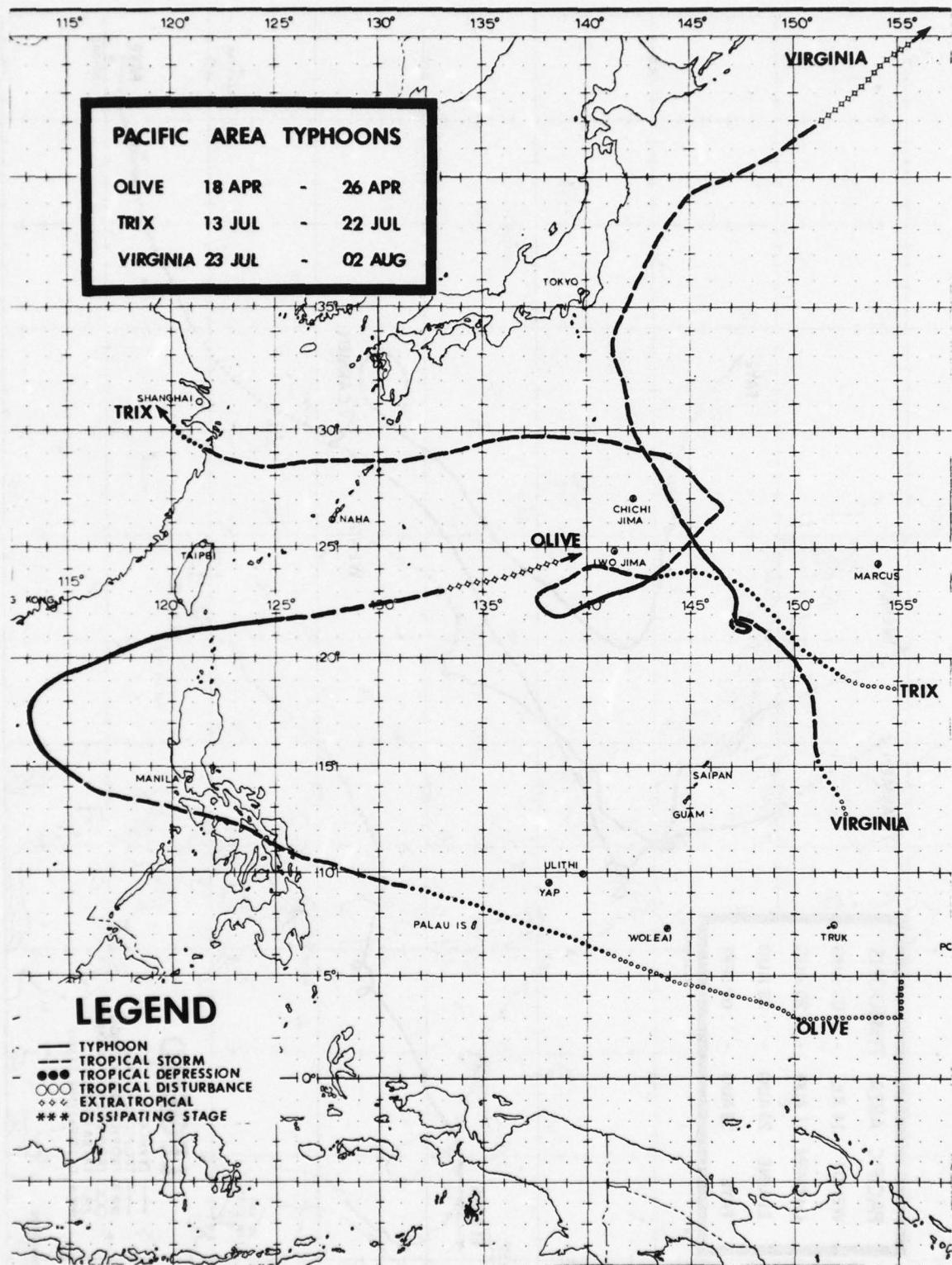


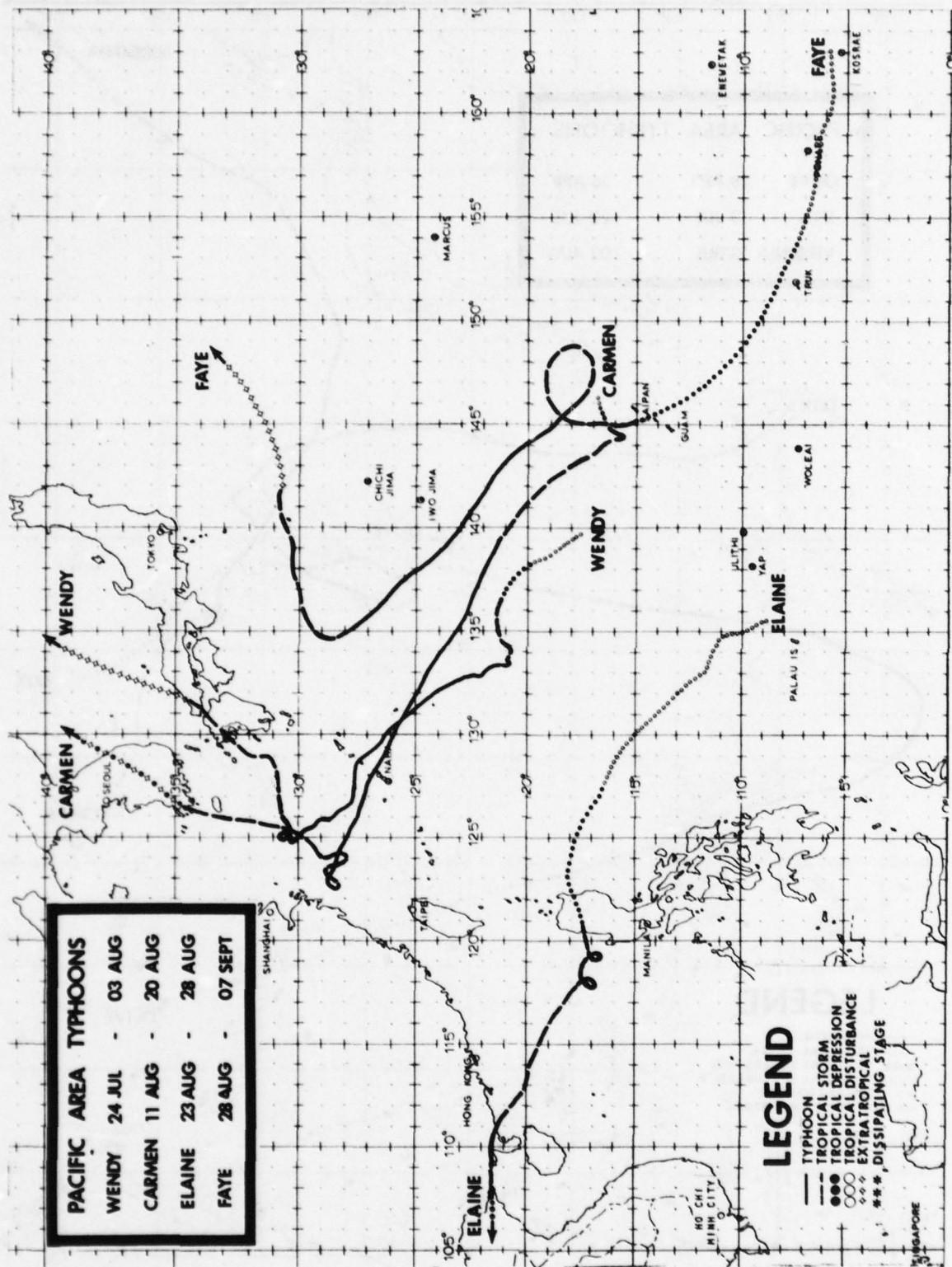


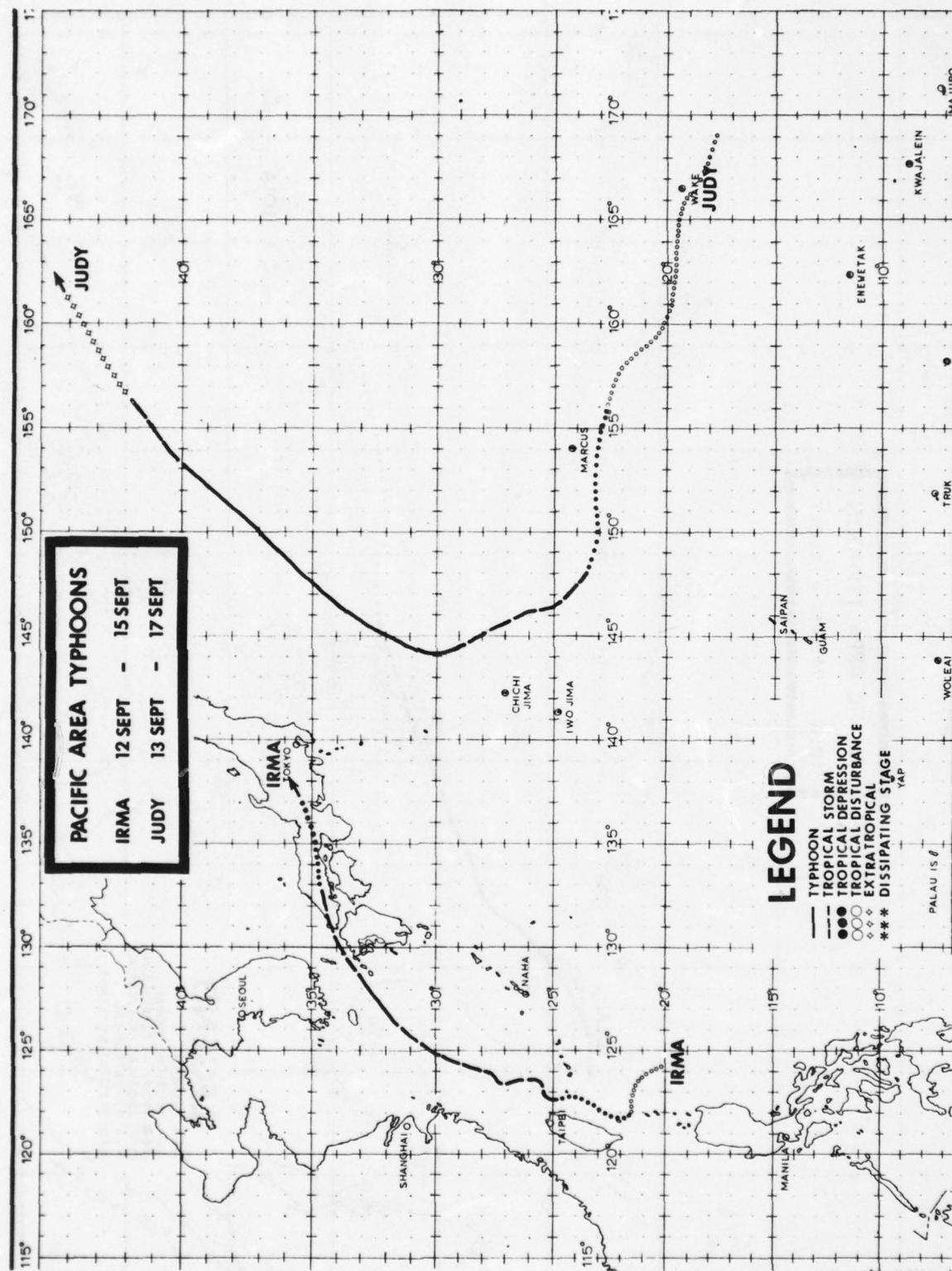


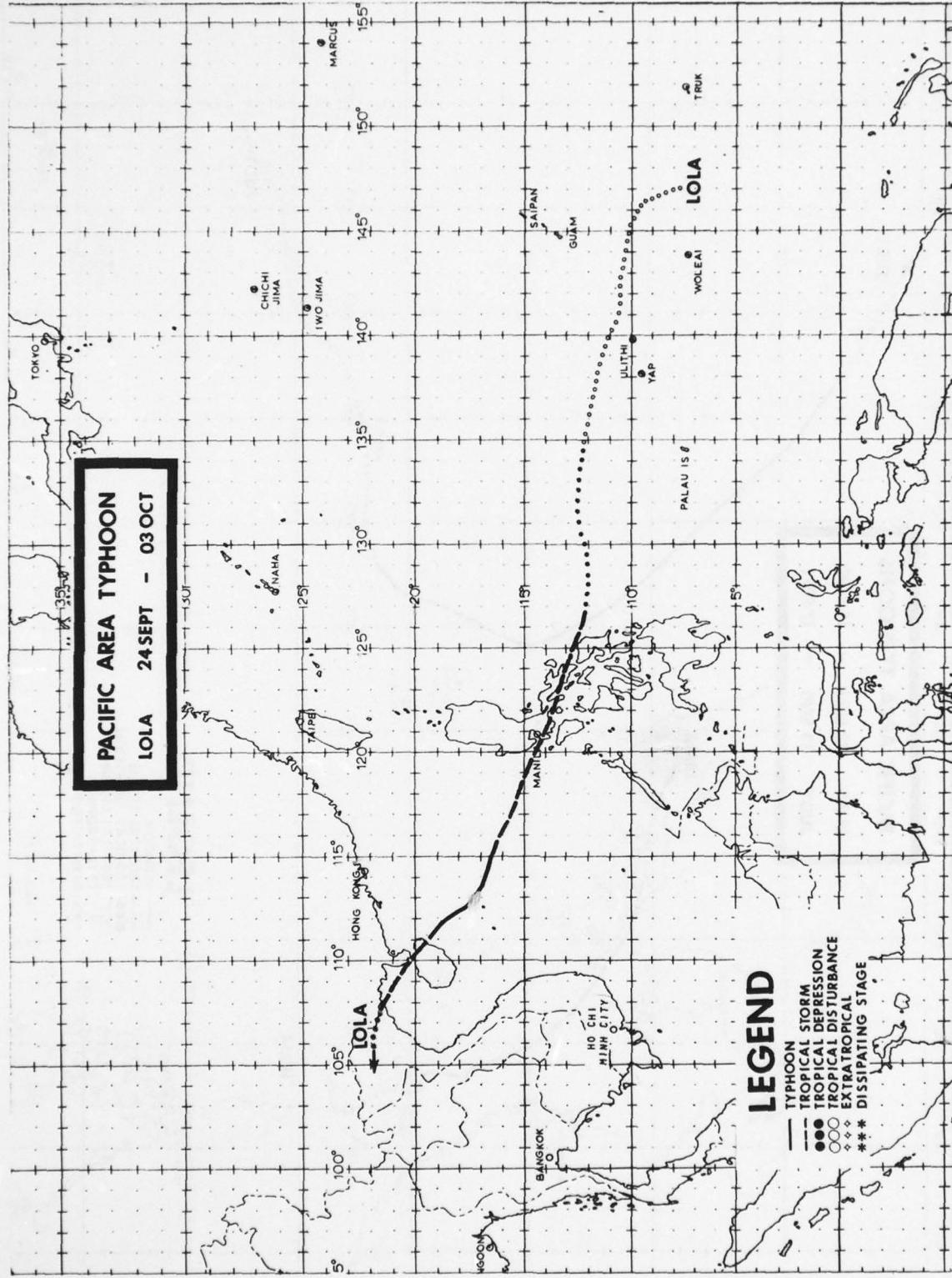


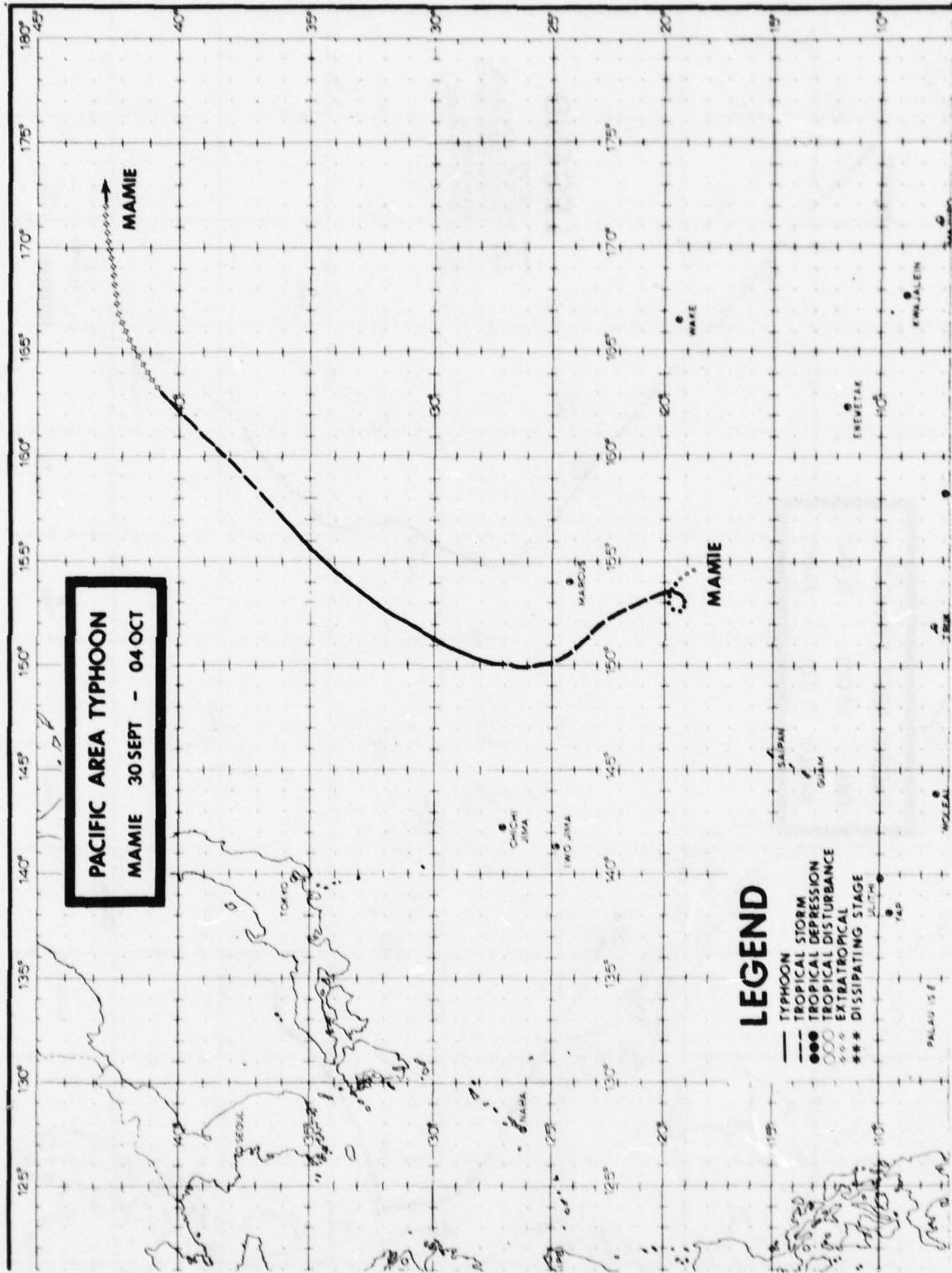


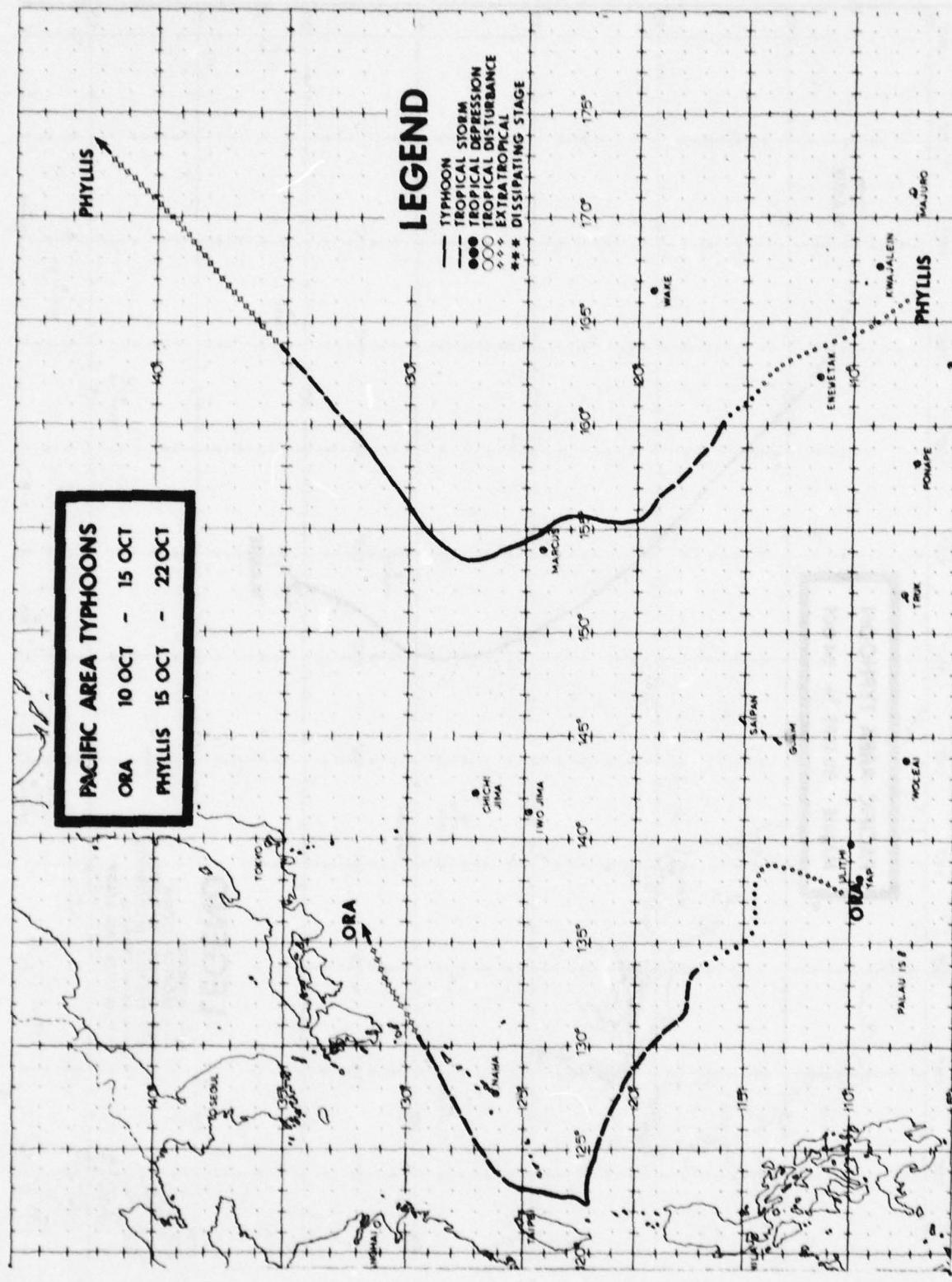


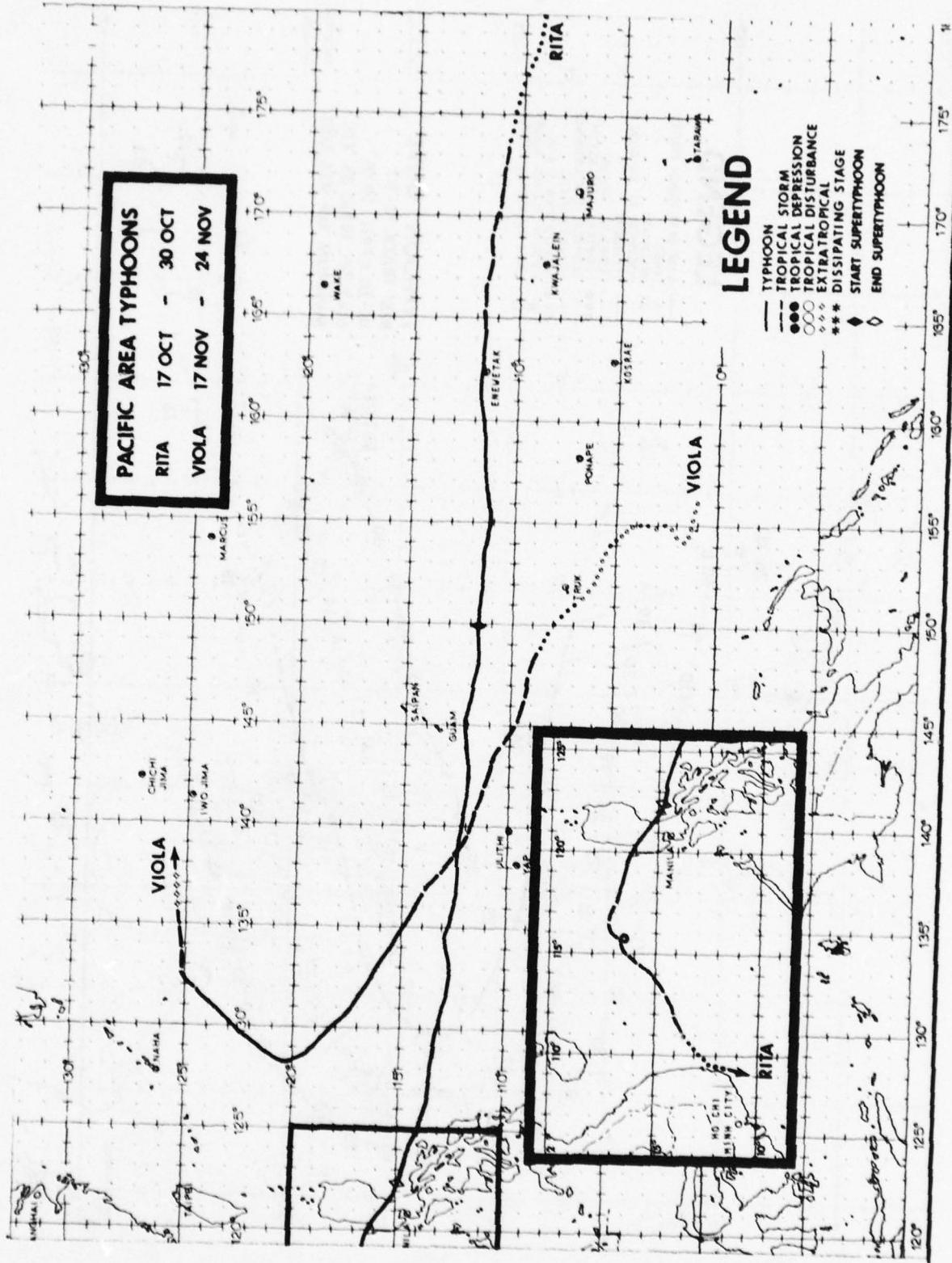


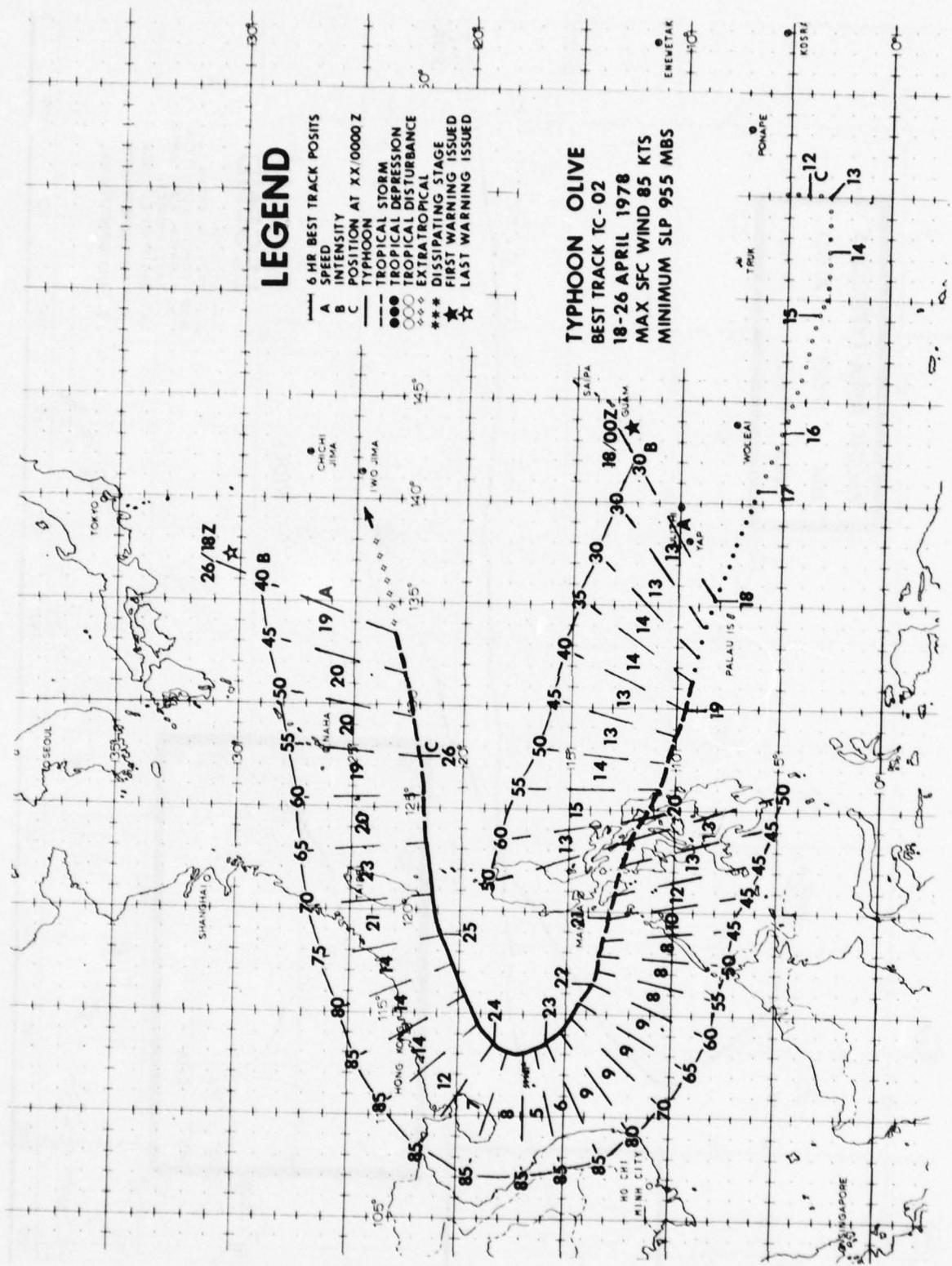












TYPHOON OLIVE

Early April 1978 saw the near-equatorial trough (NET) slowly shift northward and become more active as the sun made its seasonal progression toward summer solstice. Within the NET, a surface circulation was first analyzed on the 11th at 1200Z near 05N-155E and initially meandered southward then westward at approximately 8 kt (15 km/hr) over the next four days. This circulation eventually developed into the first typhoon of the year, Olive.

Anticyclonic outflow at the 200 mb level was first noted in the vicinity over the surface circulation at 131200Z. Although weak, this outflow persisted for the next two days. By the 16th, satellite imagery and synoptic data indicated increased organization. A formation alert was issued at 160600Z and extended for another 24 hours at 170600Z as aircraft and satellite data confirmed that development was slower than expected. Based on satellite and synoptic data, the first warning on Tropical Depression 02 was issued at 180000Z. A subsequent aircraft fix at 180252Z found a central pressure of 1001 mb and estimated the maximum surface winds to be 30-35 kt (15-18 m/sec).

The mid-tropospheric subtropical ridge was well established at this time with the east-west axis varying between 17-20N. This resulted in the cyclone, once organized, tracking west-northwest at speeds faster than climatology. Satellite data indicated good outflow aloft with continuous intensification resulting. The intensification noted in the 24 hours prior to landfall was in good agreement with climatology. TD-02 was upgraded to Tropical Storm Olive on the 18th at 1800Z. Tropical Storm Olive passed through the Leyte Gulf with maximum sustained winds of 60 kt (31 m/sec).

While crossing the central Philippine Islands, Olive continued her 13 kt (24 km/hr) speed but weakened to 45 kt (23 m/sec) intensity. Upper level outflow remained good during the transit and Olive exited intact into the South China Sea after 201800Z. The combination of good outflow aloft and warm water in the South China Sea caused Olive to reintensify and reach typhoon intensity at 220600Z. The storm recurved through a break in the subtropical ridge along 113E that had been forming since 220000Z. Figure 3-1 shows the three-hourly surface reports from the Paracel Islands (WMO 59981) when Olive passed nearby. A maximum intensity of 85 kt (44 m/sec) was reached 12 hours before recurvature and continued until the 24th at 1200Z.

The recurvature was quite sharp due to strong, deep westerly upper-air flow in the latitudes of 20-30N. Figure 3-2 shows the cirrus outflow to the north and northeast of Olive being affected by the strong westerlies. After recurvature, Olive accelerated out to the east-northeast, staying approximately 180 nm (330 km) south of the maximum wind zone. Gradual weakening occurred after recurvature as cooler, drier air was ingested into the storm with Olive finally becoming extratropical over cooler waters at 1800Z on the 26th of April.

Post-analysis showed that numbered warnings should have begun near 170000Z. Although the system was not fully defined at this time and difficult to pinpoint on satellite data, enough information was available to predict storm force winds were possible within 48 hours. Recurvature was considered probable early in Olive's life and discussed on prognostic reasoning messages. However, the recurvature track was much sharper than initially forecast. More emphasis should have been placed on the depth and strength of the westerlies north of the narrow, subtropical ridge and tracks of previous April cyclones (analogous) should have been studied closely.

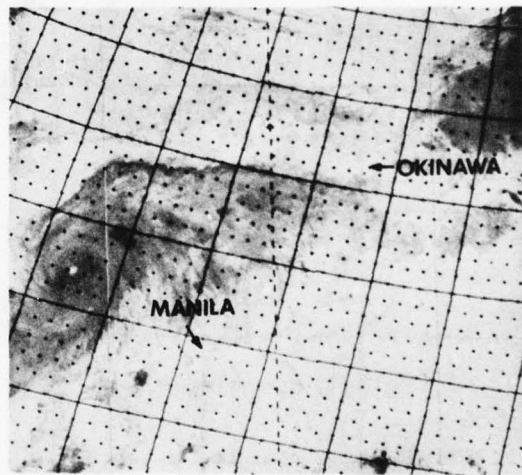
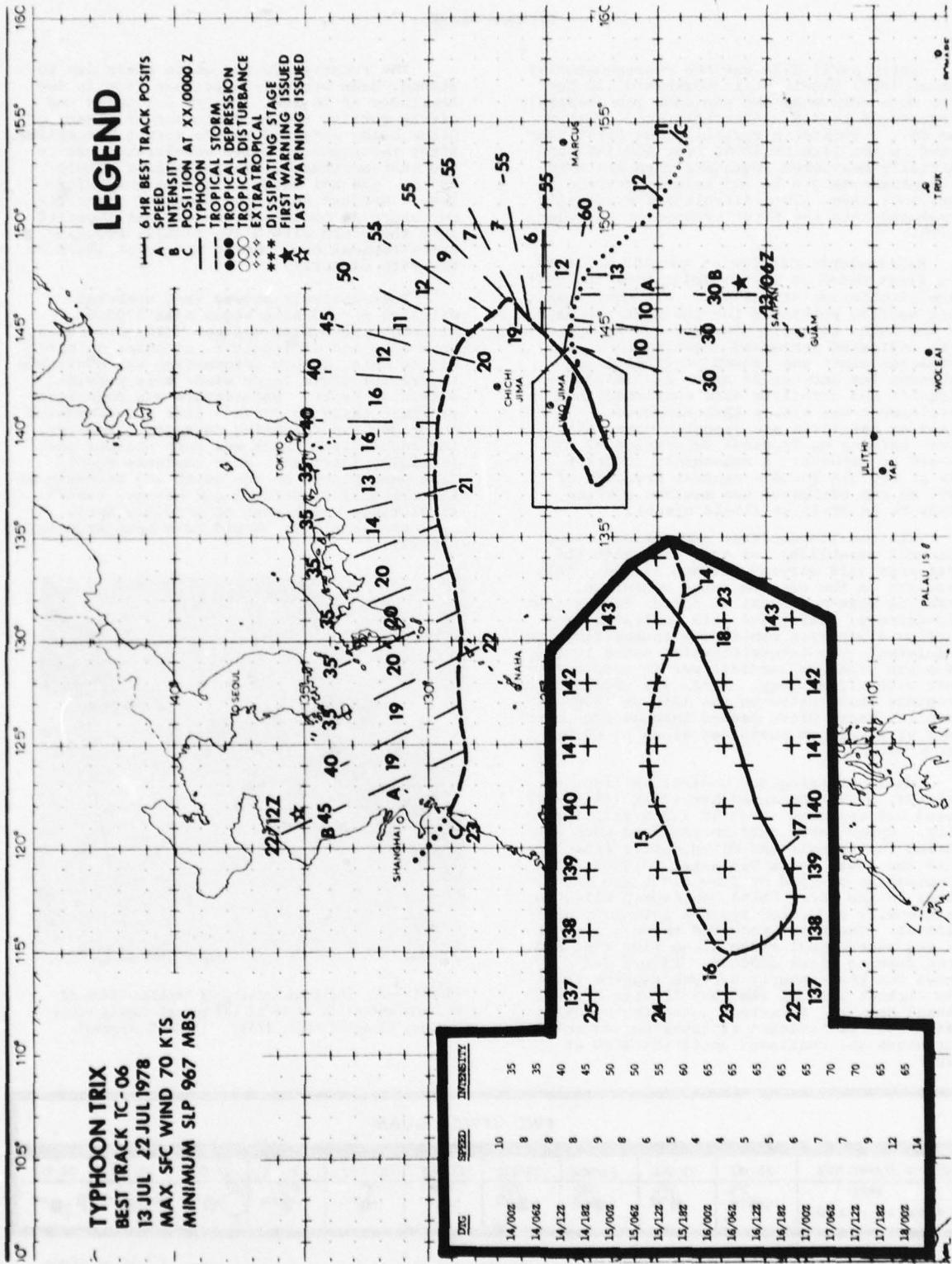


FIGURE 3-2. Infrared imagery of Typhoon Olive at maximum intensity of 85 kt (44 m/sec) during recurvature, 23 April 1978, 1158Z. (NOAA-5 imagery)

FWC/JTWC GUAM										
DATE: 22-23 APRIL 1978	22/18Z	22/21Z	23/00Z	23/03Z	23/06Z	23/09Z	23/12Z	23/15Z	23/18Z	23/21Z
59981 PARACEL ISLANDS	053	029	029	009	951	896	916	973	002	015

FIGURE 3-1. Three-hourly surface synoptic observations from the Paracel Islands during passage of Typhoon Olive.



TYPHOON TRIX

Trix, 1978's second typhoon, was a difficult tropical cyclone to forecast due to an unusual track which included a four day, 700 nm (1300 km) perimeter, cyclonic loop. The degree of difficulty was reflected in warning statistics such as: eleven warning relocations, two warning amendments, and an average 24 hour forecast error of 174 nm (322 km).

Trix originated from a wave in the east-erlies which became significant along 148E from 10N-25N on the 10th of July. A day later, a surface circulation was noted within the wave 550 nm (1000 km) northeast of Guam. Over the next 48 hours, the wave drifted northwest at 05-07 kt (09-13 km/hr) and moved under an area of diffidence caused by a tropical upper tropospheric trough (TUTT) to the west. Potential for development being excellent, a formation alert was issued at 0600Z on the 12th.

The first aircraft reconnaissance flight into the alert area found a cyclonic circulation with a circular area of calm winds, 100 nm (185 km) in diameter. Based on this 130407Z information and continued outflow aloft possible, the first warning was issued at 130600Z on Tropical Depression 06 (TD 06).

Over the next 18 hours, TD 06 moved west at approximately 10 kt (18 km/hr). Subsequent aircraft reconnaissance observed the minimum sea level pressure continuing to decrease; tropical storm intensity was reached on the 14th at 0000Z.

Metsat data at 142220Z (Fig. 3-3) showed Trix to be a very compact tropical storm with outflow only three degrees in diameter. Midget storms have been reviewed in the literature and been found to exhibit erratic intensity trends and Trix held true to form. Figure 3-4 shows the diurnal variation of the sea level pressure as observed by dropsonde.

Also shown are the differences between the maximum sustained surface winds as estimated from aircraft reconnaissance and those obtained from an empirically derived JTWC formula:

$$V_{max} = 6.7(1010. - MSLP) \exp 0.644$$

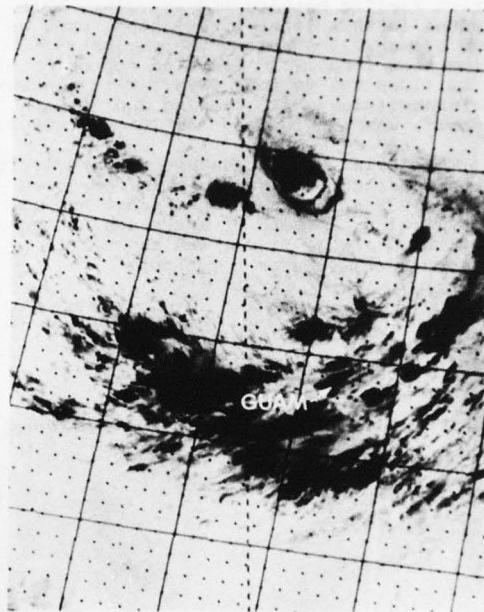


FIGURE 3-3. Infrared image of TRIX at tropical storm intensity, 14 July 1978, 2220Z. The cloudiness over Guam in the deep convergent southwest flow is quite a distance from TRIX, signifying the large extent of the cyclonic circulation in which TRIX was embedded. (DMSP imagery)

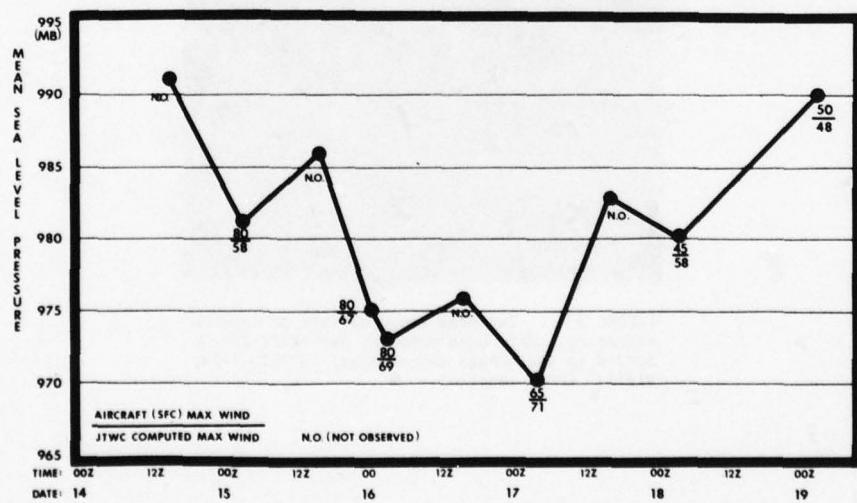


FIGURE 3-4. Time cross section of TRIX's minimum sea level pressure.

These differences may be due to larger gust spreads in compact storms which may give the appearance of stronger maximum surface winds than were actually present.

In addition to erratic intensity trends, Trix's track was quite extraordinary. On the 15th at 0000Z, a large cyclonic circulation dominated the mid-tropospheric flow in the western Pacific between 13N and 23N. Trix, embedded in this large circulation, made a large cyclonic loop along the periphery. During this loop, Trix traveled approximately 700 nm (1300 km) in four days. Trix continued intensifying while looping and typhoon intensity was attained on the 16th at 0000Z.

The Aerial Reconnaissance Weather Officer (ARWO) reported on his post-mission report for the 160326Z fix that "the storm had all the typical parameters of a typhoon but on a miniature scale." Figure 3-5 shows Trix still compact, even as a typhoon.

A large, subtropical high pressure center began building near 40N-170W at 0000Z on the

19th. This feature finally provided the necessary strong easterlies to break Trix out of her loop by 0600Z on the 19th. Prior to this change in track, Trix had weakened again to tropical storm strength (on the 18th at 1200Z).

The subtropical ridge continued building westward over Japan steering Trix westward by 1200Z on the 20th. This was the final, significant change in track. Trix meandered westward thereafter and made landfall on the east coast of China near Linhai.

The 211800Z, official warning indicated downgrading of Trix to tropical depression stage with maximum sustained winds of 30 kt (15 m/sec) as satellite and aircraft reconnaissance data showed a weakening trend. However, post-analysis of synoptic data received after-the-fact revealed that Trix maintained minimal tropical storm intensity and reached a secondary maximum intensity just prior to landfall. The aircraft no-fly line prohibited aircraft reconnaissance from observing this secondary maxima.

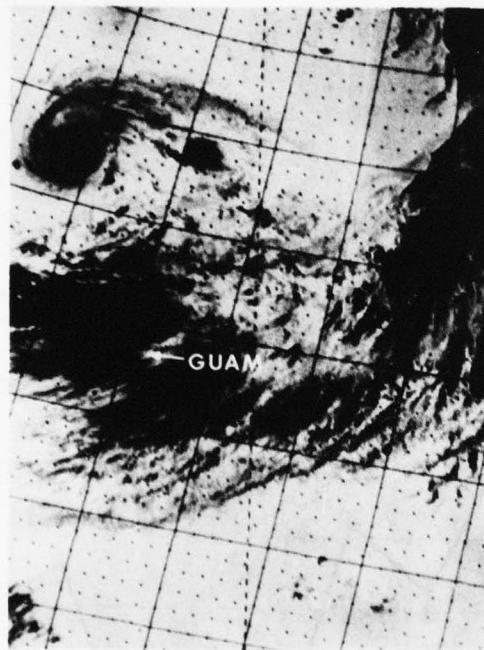
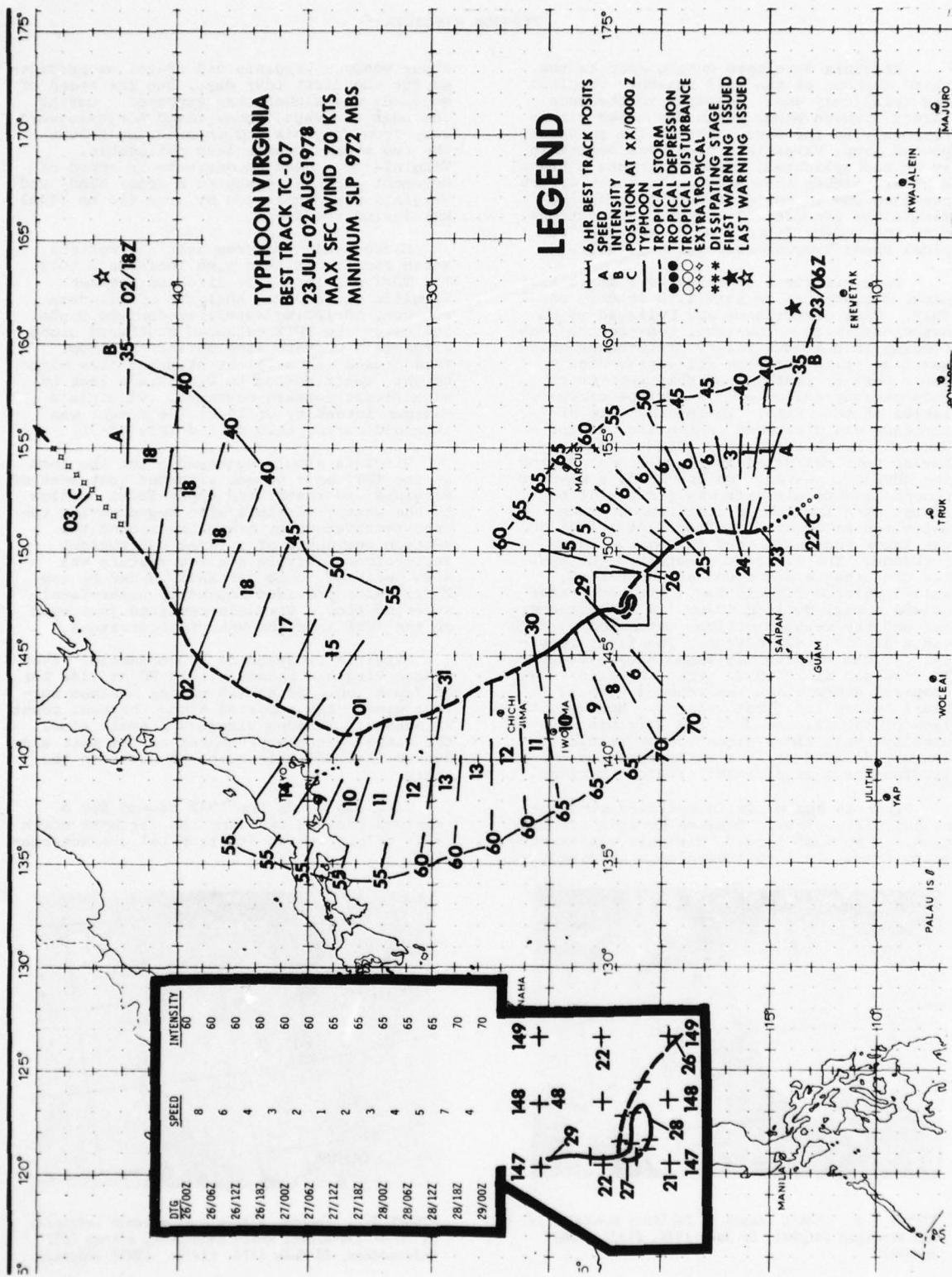


FIGURE 3-5 . Infrared image of Trix at typhoon intensity, still very compact, and still embedded in the larger circulation, 16 July 1978, 0107Z. (DMSP imagery).



TYPHOON VIRGINIA

Virginia developed during July as the third typhoon of the 1978 season. Virginia was relatively small compared to the much larger Typhoon Wendy which developed simultaneously to the west. Except for an unexpected loop, Virginia's track was definable as an uncomplicated, broad recurvature track. However, higher than average forecast errors resulted due to the difficult forecasting situations produced by complex interactions with the nearby Typhoon Wendy and the Tropical Upper Tropospheric Trough (TUTT).

Virginia first appeared as a small tropical disturbance on satellite imagery on 21 July. This disturbance was believed to be associated with a low-level convergence zone feeding into a much larger disturbance which was developing over the Philippine Sea. There were no nearby land/ship reports to indicate any evidence of a surface circulation at this time. Therefore, this disturbance was discussed in the Significant Tropical Weather Advisory (ABEH PGTW) as having poor potential for development during the advisory period. On the 23rd, a weather reconnaissance aircraft was first sent to investigate the larger disturbance (then estimated at 30 kt (15 m/sec) intensity) and was later sent east into the smaller disturbance. The aircraft penetrated the smaller disturbance and found an unexpected, well-developed circulation. Aircraft radar showed a well-defined 40 nm (74 km) diameter eye and the weather officer estimated surface gusts at 55 kt (28 m/sec). The first tropical cyclone warning was immediately issued on TS Virginia at 230600Z. Post analysis showed tropical storm stage was reached 6 to 12 hours before the first warning. However, the lack of significant data and Virginia's unusually small cloud signature on satellite imagery delayed earlier interpretation of Virginia as a significant tropical cyclone.

Virginia and Wendy intensified simultaneously (Fig. 3-6). Because Wendy's circulation was so much larger, Virginia was expected to travel in a counter-clockwise direction

about Wendy. Virginia did travel as predicted for the first four days, but the speed of movement was slower than expected. During the next two days, Wendy moved northwestward away from Virginia and interaction between the two storms became less noticeable. Virginia continued to decrease in speed of movement and then executed a loop; Wendy and Virginia were separated by over 800 nm (1482 km) during the loop.

Macro-scale features over the western North Pacific at this time included a TUTT. The TUTT was initially situated between Virginia and Japan. Analysis of all data sources, including satellite-derived winds, indicated the TUTT extended southward along Virginia's western side during the loop. This caused inconsistent steering flow with height, contributing to Virginia's lack of significant forward movement. Virginia's maximum intensity of 70 kt (36 m/sec) was attained during this period (Fig. 3-7).

Virginia slowly weakened after the loop as the TUTT axis became situated just west of Virginia and restricted upper-level outflow to the west. Virginia also began moving toward recurvature by traveling around the western periphery of a large subtropical anticyclone. Virginia's recurvature was also believed to be partially aided by the TUTT, which provided southerly upper-level steering flow. Virginia remained just east of the TUTT axis throughout recurvature.

Virginia produced no known damage. Even though Virginia passed within 80 nm (148 km) of Japan, only 20 kt (10 m/sec) maximum surface winds were reported along the east coast of Honshu. Besides Virginia's small size, the winds were always weaker on the west side due to the TUTT axis being so close to the storm.

Virginia holds the 1978 record for a tropical cyclone tracking the farthest north (47N) before losing its tropical characteristics.

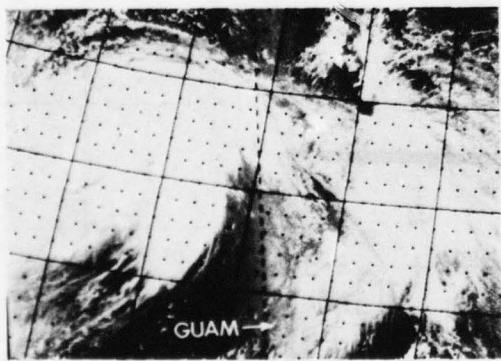


FIGURE 3-6. Early stages of Typhoons Wendy (left) and Virginia (right), 26 July 1978, 0133Z. (DMSP imagery)

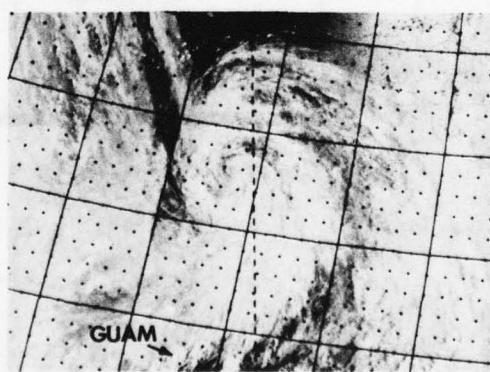
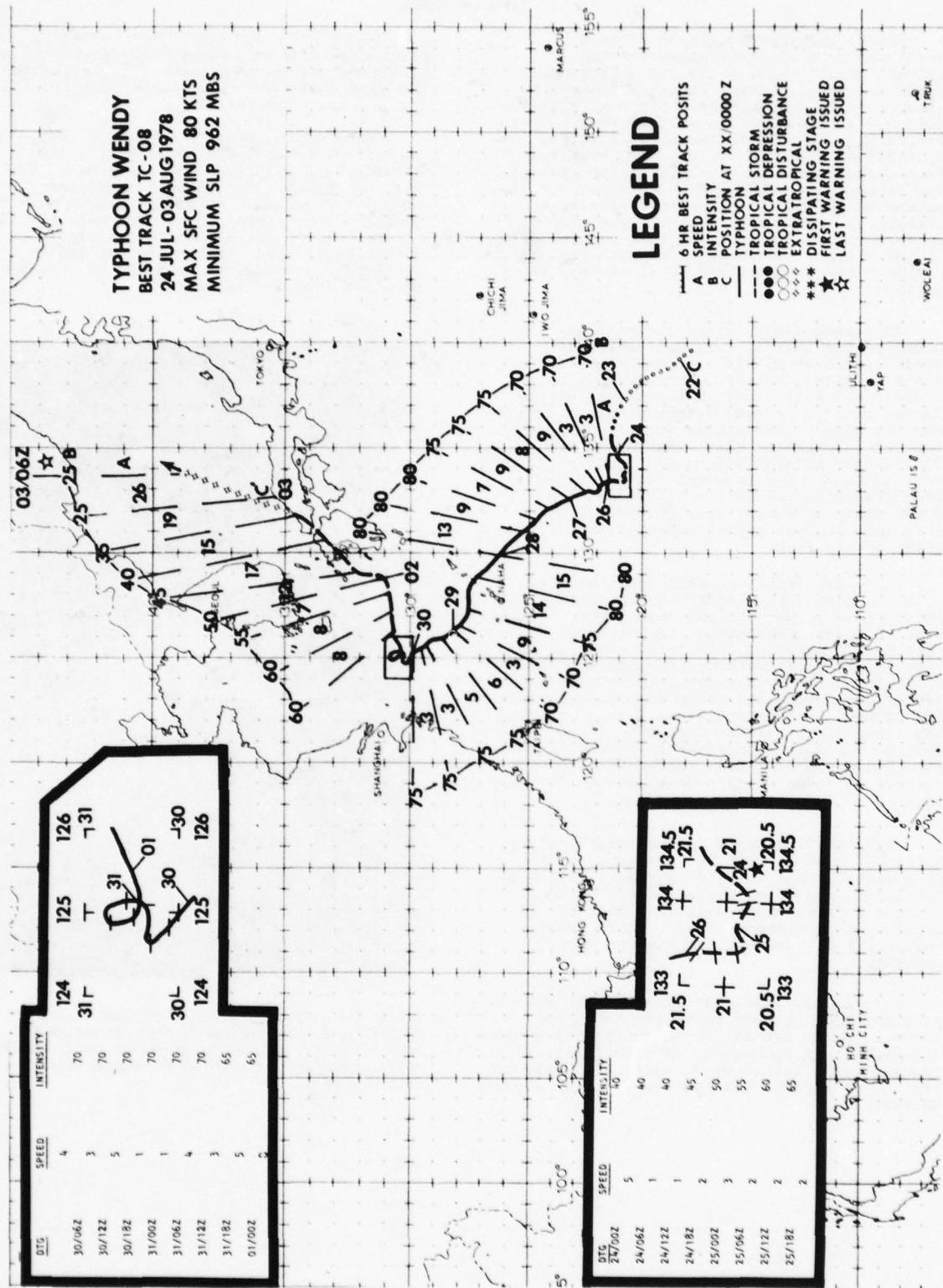


FIGURE 3-7. Typhoon Virginia at maximum intensity of 70 kt (36 m/sec) while undergoing strong TUTT interaction, 28 July 1978, 2141Z. (DMSP imagery)



TYPHOON WENDY

Wendy, the fourth typhoon of 1978, developed in a well-established monsoon trough. The trough, which had existed for seven to ten days prior to significant tropical cyclone development, laid over WESTPAC from 07N at the Dateline west-northwest over the Mariana Islands to the Luzon Straits. By 1200Z on the 22nd of July, two weak surface circulations were evident in the trough, one centered at 19.8N-138.2E which eventually became Wendy and the other at 14.5N-151.4E (Virginia). With the Tropical Upper Tropospheric Trough (TUTT) lying just to the north of the surface trough, the dynamics for significant tropical cyclone development were present.

Increased organization on the 22nd prompted the initial reconnaissance aircraft launch at 2130Z. The ARWO observed 25-30 kt (13-15 m/sec) surface winds, but could not locate a definable surface circulation center. Based on this aircraft data and the good potential for increased development a formation alert was issued at 230456Z for an area 660 nm (1222 km) northwest of Guam. The tropical cyclone developed rapidly thereafter; it reached tropical storm intensity near 231800Z (Fig. 3-8) and obtained typhoon strength by 1800Z on the 25th.

Wendy meandered westward from the 23rd till the 25th when a break developed in the subtropical ridge with the high center, northeast of Wendy, dominating and building. In response to stronger, mid-level southeasterlies, Wendy accelerated northwestward. Wendy slowly reached her maximum intensity of 80 kt (41 m/sec) during this time and maintained it for 24 hours before she began a slow weakening trend after passing over the Ryukyu Islands. A marked decrease in low-level inflow and convection near the center appeared to have affected Wendy's development at this point.

Wendy stalled again in the central East China Sea, 180 nm (333 km) east-southeast of Shanghai, when steering currents weakened. The cooler and drier environment, the decreased inflow, and finally the decrease in outflow aloft weakened Wendy. Most storms that stall in movement, intensify; Wendy weakened.

Late on the 31st, the break in the subtropical ridge became more pronounced and Wendy began to recurve northeastward at 8 kt (15 km/hr). A succession of minor, mid-level troughs first forced Wendy northward early on the 2nd of August, then accelerated her northeastward.

The cooler environment and increased frictional effects caused Wendy to weaken and lose tropical characteristics by 18Z on the 2nd after existing as a significant tropical cyclone for 10 days.

Twice during Wendy's existence (240000Z to 260000Z and 300600Z to 311800Z), she slowed significantly. The portions of the best track shown for these periods are among many possible solutions. With fix-to-fix movement near to or less than the fix accuracies, it was almost impossible to determine if Wendy just slowed to 1-3 kt (2-6 km/hr), underwent looping, or simply remained "quasi-stationary".

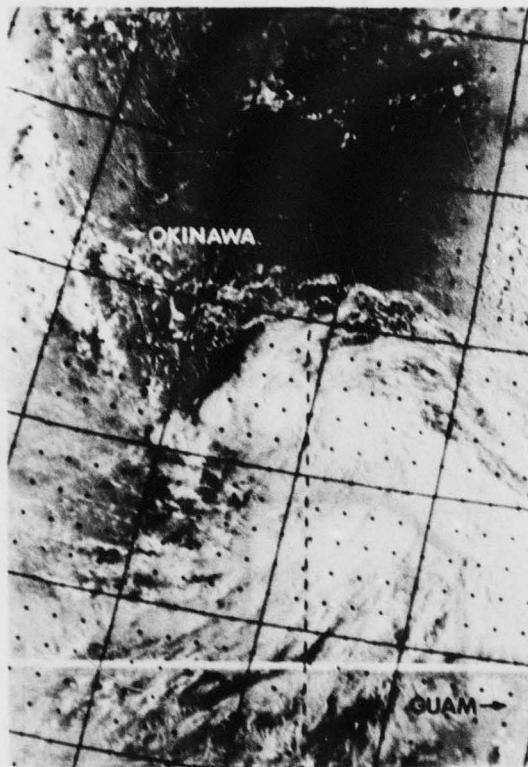
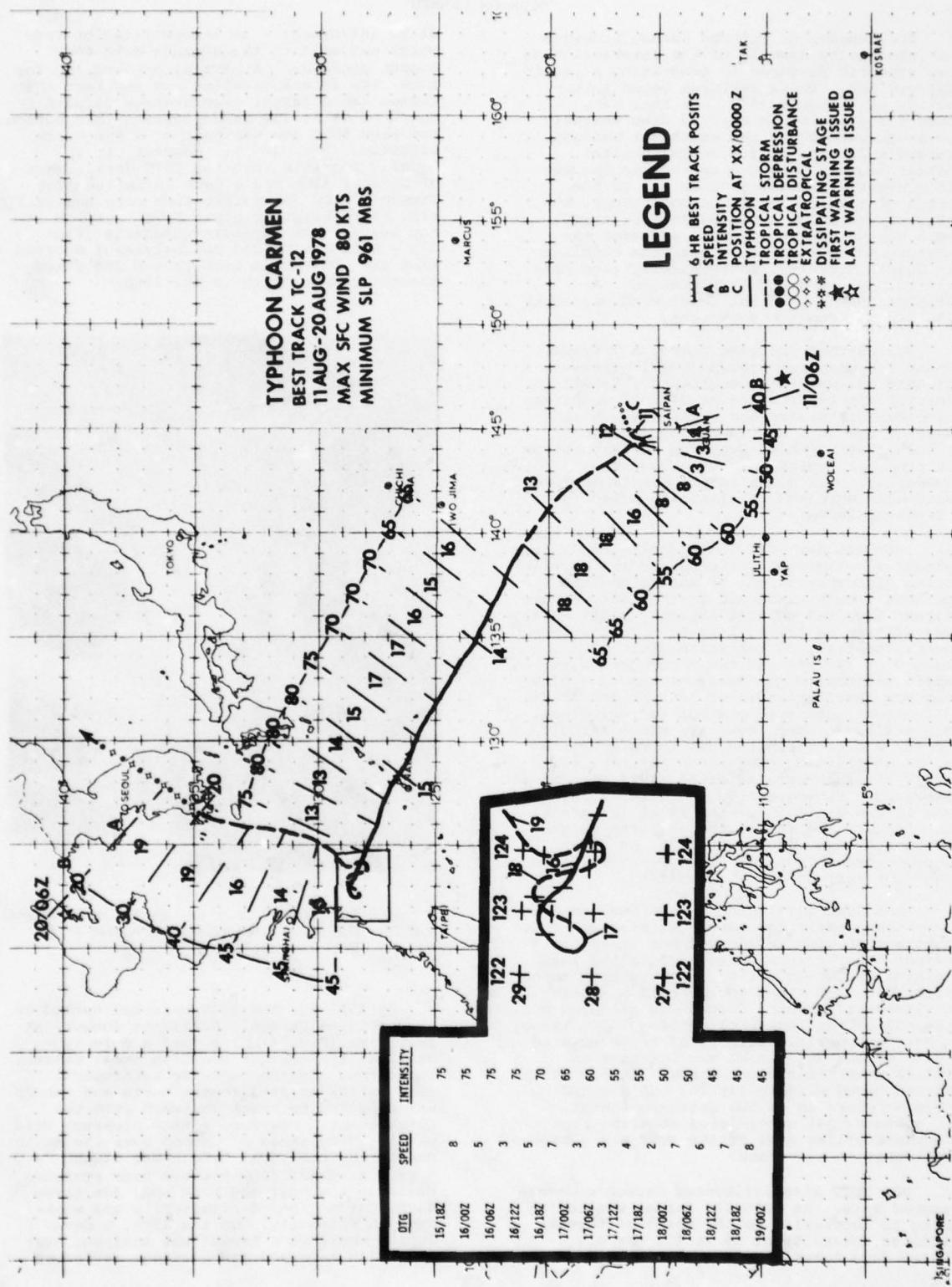


FIGURE 3-8. Wendy as a young tropical storm, 23 July 1978, 2117Z. Typical of circulations in the monsoon trough, maximum cloudiness exists in the deep southwesterlies just south of the trough axis. (DMSP imagery)



TYPHOON CARMEN

The genesis of Typhoon Carmen provides an interesting example of the interaction of two synoptic features in generating a tropical cyclone. These features began interacting on 7 August 1978. On that day, Guam's surface winds shifted from easterly to southwesterly as the southwest monsoon surged well east of its normal habitat. Metsat imagery showed a noticeable upsurge in convective activity along and to the south of the low level monsoon trough, the axis of which now extended from Southeast Asia across the Philippines and over the western North Pacific to near the dateline. In Guam's vicinity, southwesterly flow persisted, deepened and strengthened. At 081200Z Guam's gradient level wind was 20 kt (10 m/sec) from the southwest.

During the same time frame, a Tropical Upper Tropospheric Trough (TUTT) northwest of Guam was deepening southward. Satellite derived upper-air winds at 081200Z confirmed considerable divergence existed south and east of the TUTT overlying the monsoon trough just north of Guam and definite signs of tropical cyclone organization were appearing. Six hours later, Guam's gradient wind had increased to 31 kt (16 m/sec) out of the southwest.

For the next day, this upper-level/lower-level interaction persisted and the developing disturbance, one of many along the monsoon trough discussed in the daily Significant Tropical Weather Advisory (ABEM PGTW), was written as having fair to good development potential. A formation alert was issued at 100156Z and two subsequent aircraft reconnaissance missions showed a minimum sea level pressure of 1004 mb and 25 kt (13 m/sec) estimated maximum surface winds. The surface center, however, was difficult to fix and the decision was to reissue the alert at 110134Z. Three hours later, however, aircraft data reported a 992 mb central pressure. Subsequently, the first warning was issued at 110600z with 40 kt (21 m/sec) intensity. Meanwhile, the activity in the monsoon trough had also rapidly organized in another area; Tropical Storm Della was forming just east of the Philippines.

The TUTT's influence on Carmen continued beyond her early developmental stages. TUTT interaction also influenced her track and affected her size and intensification rate. Initially, Carmen's track was expected to be climatological since the overall synoptic environment in which Carmen was situated was typical of the August climatology. A strong, mid-tropospheric, subtropical ridge existed north of her and Carmen was forecast to follow a west-northwest track. In actuality, Carmen moved erratically for one day and then accelerated to the north-northwest. It appears that upper-level steering from southeasterlies east of the TUTT was a major influence on her track.

The TUTT also influenced Carmen's development rate. At 120000Z, Carmen was beginning to accelerate to the north-northwest with an intensity of 55 kt (28 m/sec). Three days later she had only intensified to

80 kt (41 m/sec) - an intensification rate which was half of the average rate for August cyclones. A partial explanation for this slow intensification was the fact that Carmen had a faster than average forward speed of 16 kt (30 km/hr) during this period and also that she was part of a two storm situation (Fig. 3-9). However, it is equally possible that the TUTT (still west of Carmen) also had a part in influencing Carmen's slow intensification rate and small size by restricting upper level outflow in her western and southern quadrants (Figs. 3-9 & 3-10). The 200 mb analyses indicated that the TUTT moved with Carmen and strengthened from the 11th to the 14th.

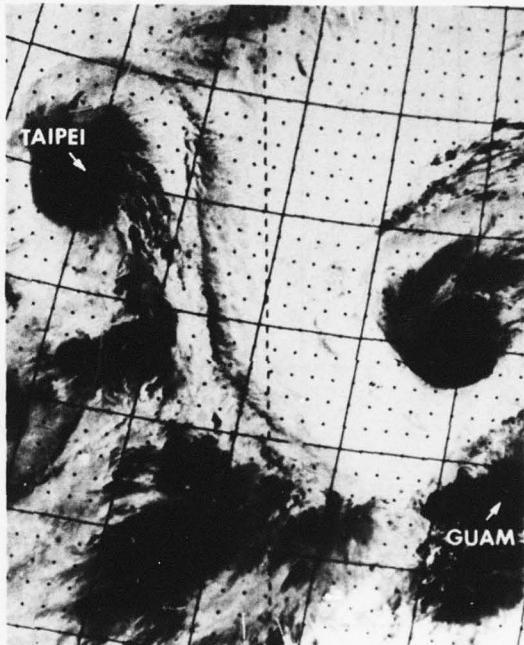


FIGURE 3-9. Infrared image of Typhoon Carmen (right) and Tropical Storm Della (left), 12 August 1978, 2134Z. (DMSP imagery)

By 151200Z, the TUTT axis had curled to the south of Carmen. Satellite imagery at this time (Fig. 3-11) showed a more symmetrical typhoon but small in areal extent. The strong mid-tropospheric subtropical ridge still existed to the north and Carmen was expected to track westward into the China coast. However, a high pressure cell was building ahead of Carmen over the Asian coast. By the 16th, Carmen was caught in a weak steering flow between high pressure cells to the east and west and, for three days, Carmen looped erratically and weakened in intensity. On the 17th, a developing short wave trough was analyzed over the Asian mainland and warnings reflected

recurvature toward Korea. At 181200Z, Carmen did begin to track northward and eventually dissipated over Korea. Despite Carmen's erratic behavior, 24-hour forecast errors matched the average for the year.

During her lifetime, Carmen was responsible for considerable damage. Before dissipating over South Korea, she caused widespread flooding, a reported 21 deaths and \$3 million worth of property damage. Saipan, affected by Carmen in her formative stage, reported flooding and property damage and was designated a national disaster area. At maximum intensity of 80 kt (41 m/sec) on August 15, Carmen passed over Okinawa about

26 nm (48 km) north of Kadena AB with little damage to DoD facilities.

The disturbance in the monsoon trough that eventually became Carmen was similar to many others that did and did not develop. And, of those that did develop, many only reached the monsoon depression stage. The difficulty in determining the development potential of these monsoon disturbances affected the timeliness of issuance of the formation alert and initial warning on Carmen. Near perfect forecasting to meet customer requirements would have allowed the initial warning to be issued 48 to 72 hours prior to the actual 110600Z issuance.

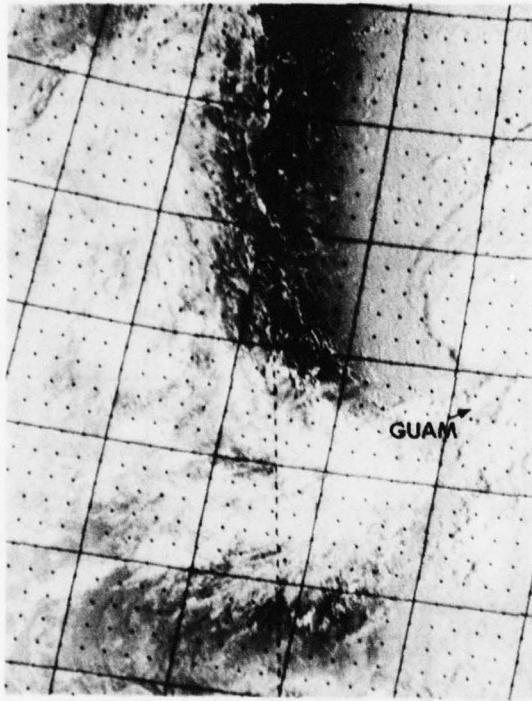


FIGURE 3-10. Restricted upper-level outflow over Carmen's western and southern quadrants, 11 August 1978, 2243Z. (DMSP imagery)

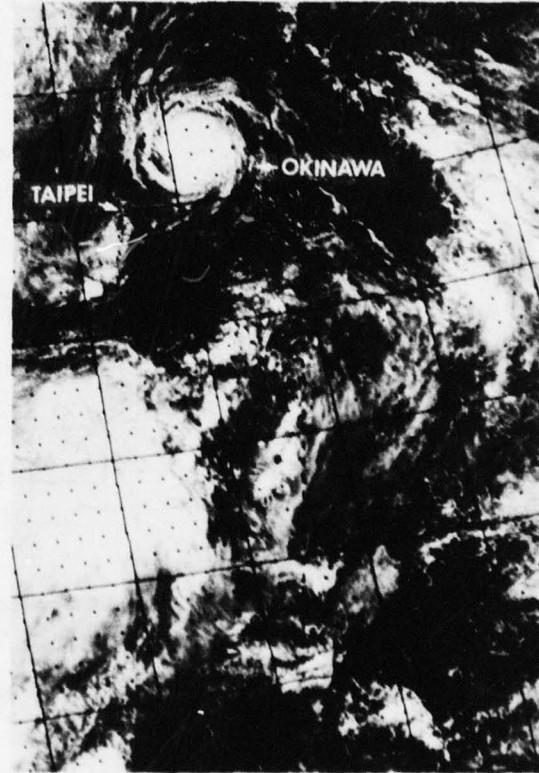
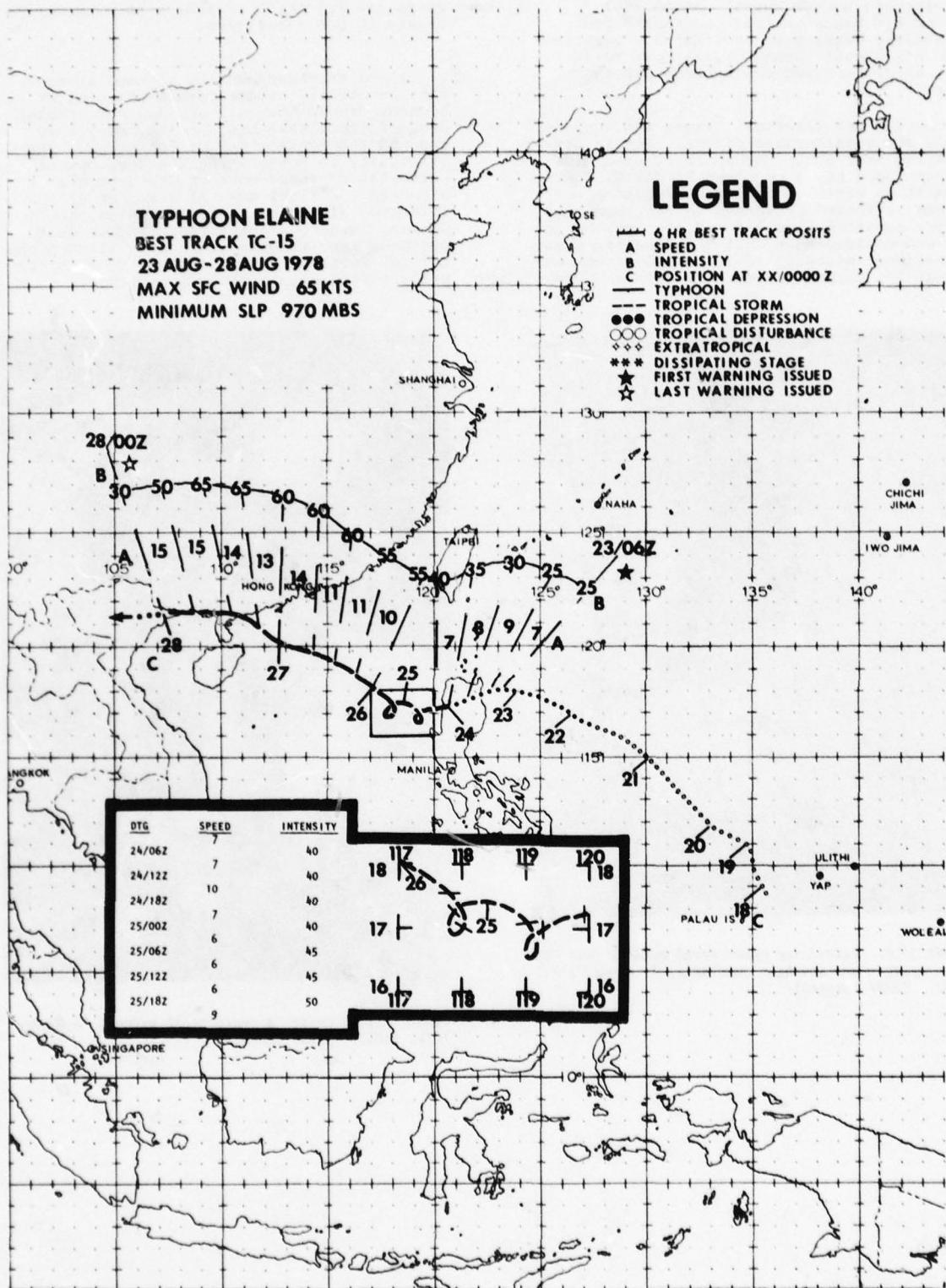


FIGURE 3-11. Carmen's small areal extent, 15 August 1978, 1505Z. (DMSP imagery)



TYPHOON ELAINE

The 17th of August 1978 saw the monsoon trough extending as far east as 140E providing the breeding ground for Typhoon Elaine. Synoptic and satellite data on the 18th indicated a tropical disturbance, with maximum winds of 15 kt (8 m/sec), organizing to the northeast of Palau. From the 18th through the 20th, this system was discussed on the Significant Tropical Weather Advisory (ABEH PGTW) with poor to fair potential for significant tropical cyclone development. The relative position of the Tropical Upper Tropospheric Trough (TUTT), north of the disturbance during this period, indicated suppression of upper level outflow in the northern portion of the system. Issuance of a Tropical Cyclone Formation Alert was delayed as a result of expected strong upper-level directional shear. The advisories on the 21st and the 22nd carried fair to good potential; however, based on sparse synoptic data and little organization evident on the satellite data, the system was still thought to be in the formative stage. The initial warning was issued at 230600Z by which time increased organization and banding features were indicated on satellite imagery. Post analysis indicated the system was a tropical depression 36 hours prior to this time.

By 240000Z, the mid-tropospheric ridge provided more definitive east-northeast steering flow across northern Luzon resulting in Elaine's southwest track, contrary to a favored climatological track to the west-northwest. Climatological studies also indicate weakening during passage over Luzon. Based on synoptic data, however, Elaine continued to intensify and was upgraded to a tropical storm at 240000Z while still over land 170 nm (315 km) north of Manila. Heavy storm damage was reported in northern Luzon.

As Elaine exited Luzon into the South China Sea, her associated cloud pattern lacked sufficient organization for optimum satellite (Fig. 3-12) and radar fixes; aircraft reconnaissance at low flight levels (restricted at times by terrain) was heavily relied on for definitive surface center fixes. During this same period, 24 - 25 August 1978, Elaine was caught between strong southwest monsoon flow and strong northeast flow. As a result, Elaine looped twice and forecast errors increased considerably.

After completing the second loop, Elaine accelerated to the northwest in response to the mid-tropospheric ridge axis' northward migration. A weakness in this ridge was apparent on the 26th and developed northeast of Vietnam due to a mid-latitude short wave. By the 27th this short wave trough was within 10 degrees of Elaine and a noticeable northward adjustment in her track resulted. The closest point of approach (CPA) to Hong Kong occurred at 270200Z with Elaine 155 nm (287 km) to the southwest.

At 270300Z, the S.S. Seal and Trade located at 21N-113E reported surface winds of 65 kt (33 m/sec) and a surface pressure of 974 mb. Based on this ship report, Elaine was upgraded to typhoon strength just prior to landfall over the southern coast of China near the Luichow Peninsula. Subsequent to landfall, Elaine tracked westward and dissipated rapidly as a result of frictional/terrain effects. Downgrading to tropical storm intensity occurred by 271800Z with the final warning issued at 280000Z.

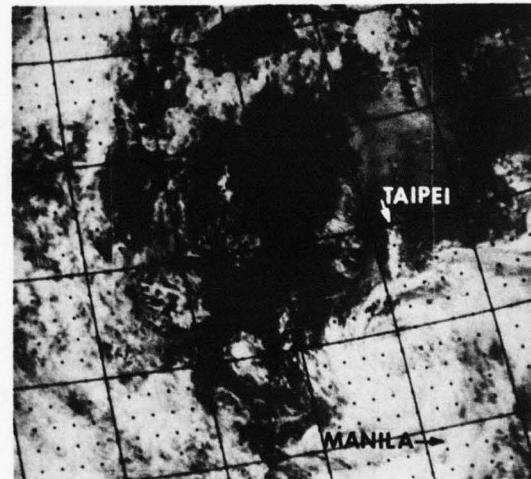
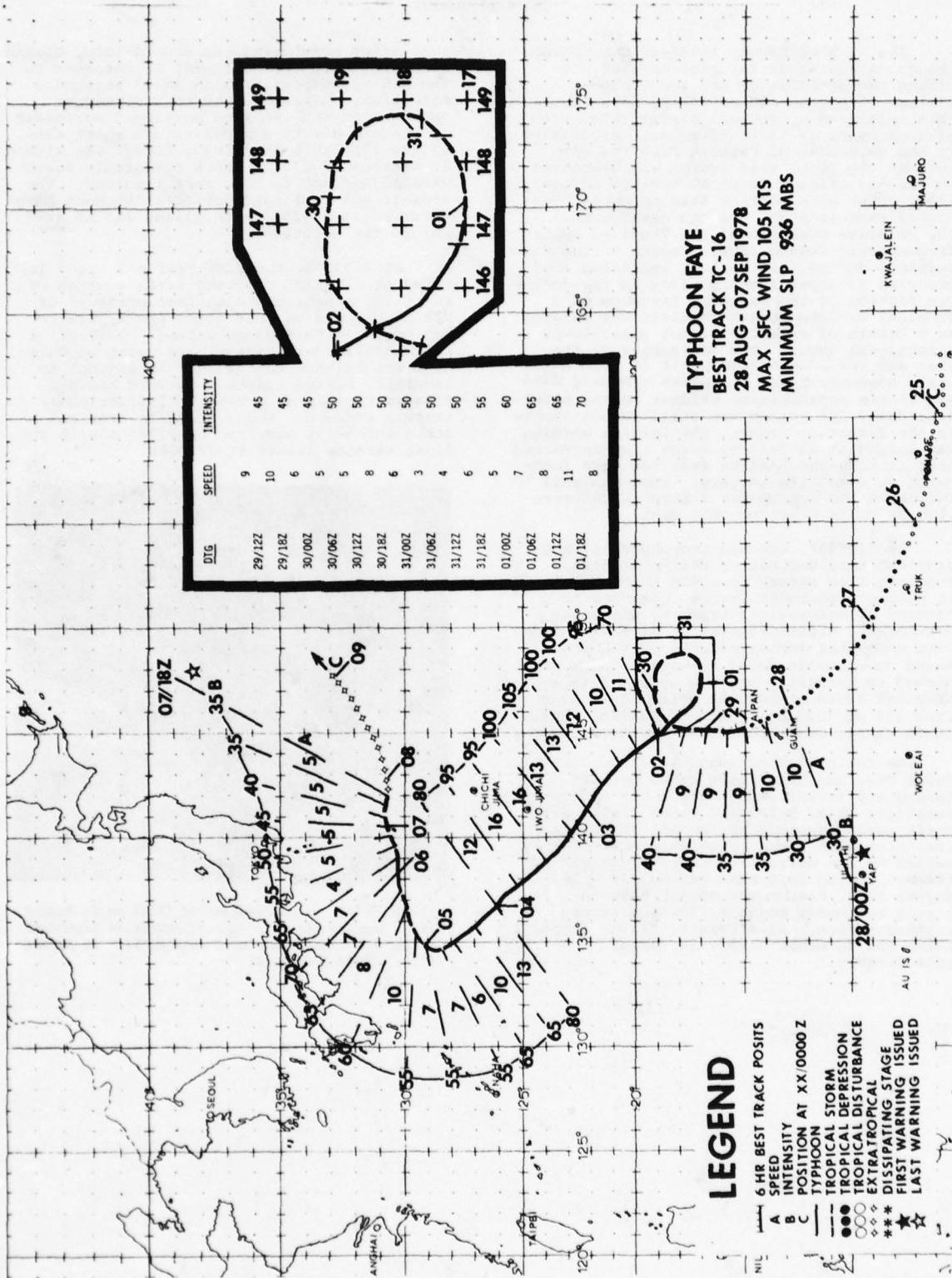


FIGURE 3-12. Visual imagery at 0134Z on 25 August 1978, showing Elaine's typical satellite signature during her erratic movement period, 24 - 25 August 1978. (NOAA-5 imagery)



TYPHOON FAYE

Typhoon Faye, the seventh typhoon of the 1978 season, was one of the most interesting, but unfortunately, also one of the year's most difficult typhoons to forecast. Besides executing an uncommon anticyclonic loop early in her development, Faye also unexpectedly re-intensified to typhoon strength shortly before becoming extratropical.

The tropical disturbance that was to become Typhoon Faye was first sighted southeast of Ponape at 242142Z, August 1978 by satellite reconnaissance. The disturbance moved west-northwest at 13 kt (24 km/hr) and at 261200Z passed north of Truk. During this period, 200 mb analyses showed a tropical upper tropospheric trough (TUTT) with an imbedded low northwest of the disturbance. This TUTT moved west-northwest in conjunction with the surface circulation thereby keeping excellent upper-level outflow in the diffluent region, southeast of the TUTT cell, over the developing tropical disturbance.

Based on an improved satellite signature and on ship synoptic data, a Tropical Cyclone Formation Alert was issued on the disturbance at 272334Z. Shortly thereafter, a reconnaissance aircraft confirmed the existence of a closed surface circulation with a minimum sea level pressure of 1000 mb. Based on this aircraft data, the disturbance was upgraded to Tropical Depression 16 at 280000Z with max winds of 30 kt (15 m/sec). The 500 mb subtropical ridge axis was at that time oriented east-west along 36N.

At 280600Z, TD-16 passed 60 nm (111 km) to the northeast of Guam and was upgraded to Tropical Storm Faye six hours later. During the next 24 hours the storm moved straight north while slowly intensifying. The 500 mb flow pattern became complex during this period due to the influence of two new developing tropical systems: TS Gloria between Luzon and Japan and TS Hester west of Marcus Island (Fig. 3-13). The 500 mb analysis at 281200Z (Fig. 3-14) showed that the Pacific Ocean south of Japan between Guam and the Philippine Islands was dominated by an elongated monsoon trough holding multiple circulation centers, one of which was to become TS Gloria. High pressure cells were located east of Tokyo and southeast of Marcus Island.

The 281200Z objective steering aids indicated Faye would track northeastward. However, because the initial pattern itself was confused, a more climatological north-northwestward track was forecast.

By 291200Z Faye began to execute a rare, anticyclonic loop. The 300000Z, 500 mb analysis (Fig. 3-15) showed that Faye was now positioned between two high pressure centers: one located between Marcus Island and the Volcano Islands, and the other located south of Guam. This pattern was the result of the combined influence of Gloria, Hester, Faye, and a long-wave, mid-level trough that was developing far to the northeast of Faye. It was now possible for Faye to choose one of

two routes: (1) move north-northeast in the weakness between Marcus Island and Wake Island; or (2) move west-northwest along the southern periphery of the high pressure center to her north.

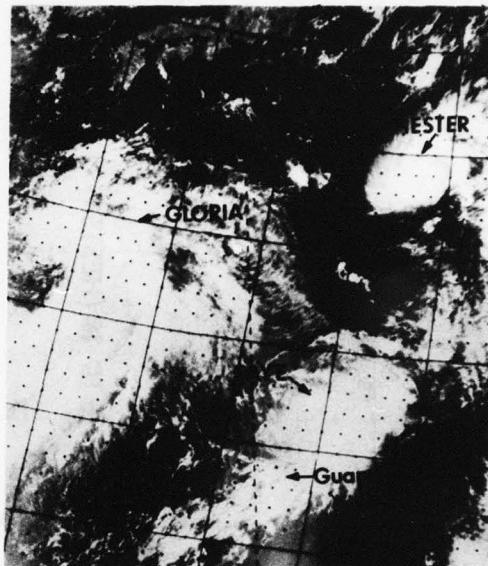
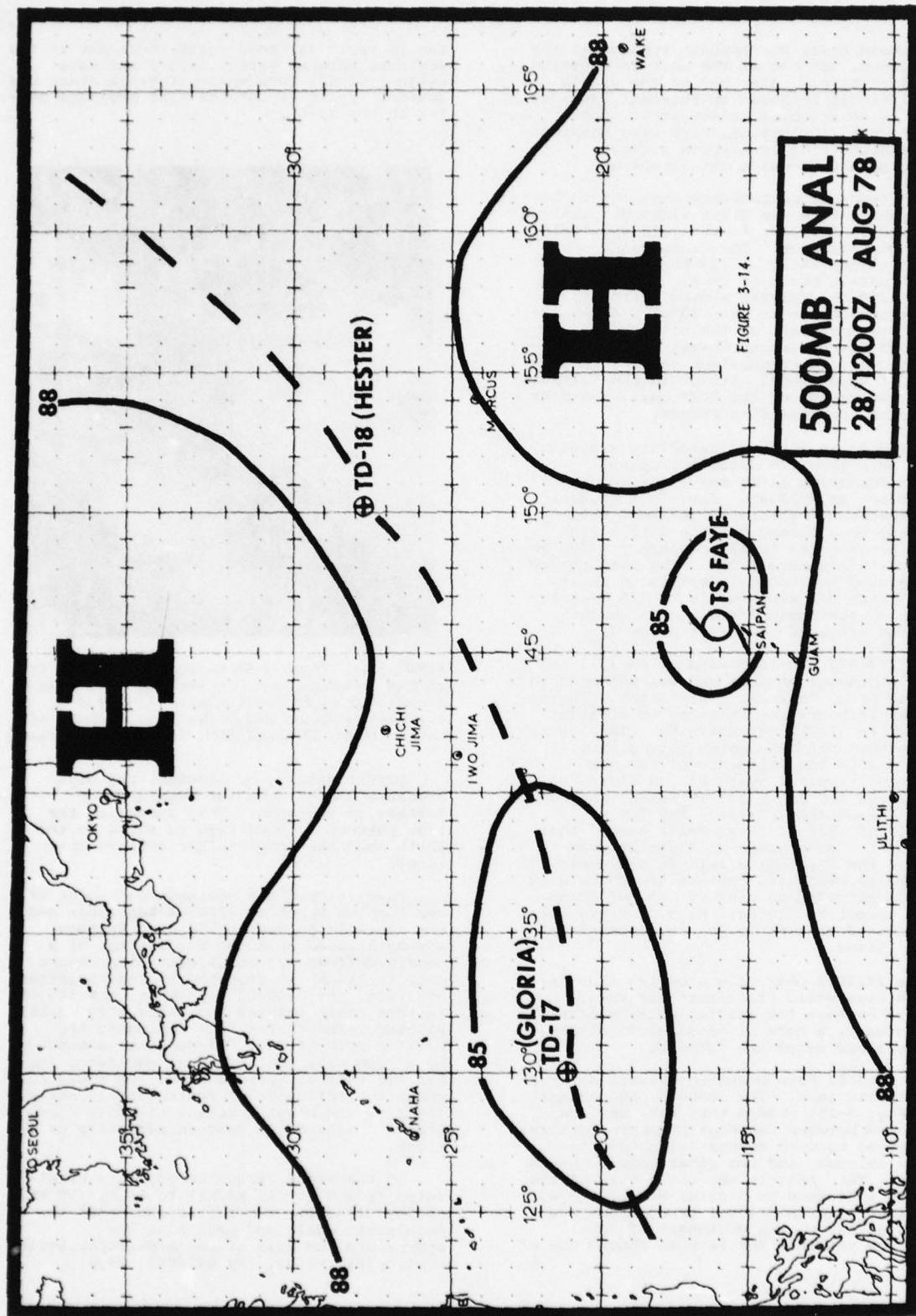


FIGURE 3-13. Tropical Storm Faye just prior to executing an anticyclonic loop north of Guam, while at an intensity of 40 kt (21 m/sec). TS Gloria is southeast of Okinawa and TS Hester is northwest of Marcus Island, 29 August 1978, 0137Z. (DMSP imagery)

Unfortunately, by 310000Z, the high pressure center south of Guam shifted further to the west. This change in the flow pattern allowed Faye to swing to the south and thus complete her anticyclonic loop.

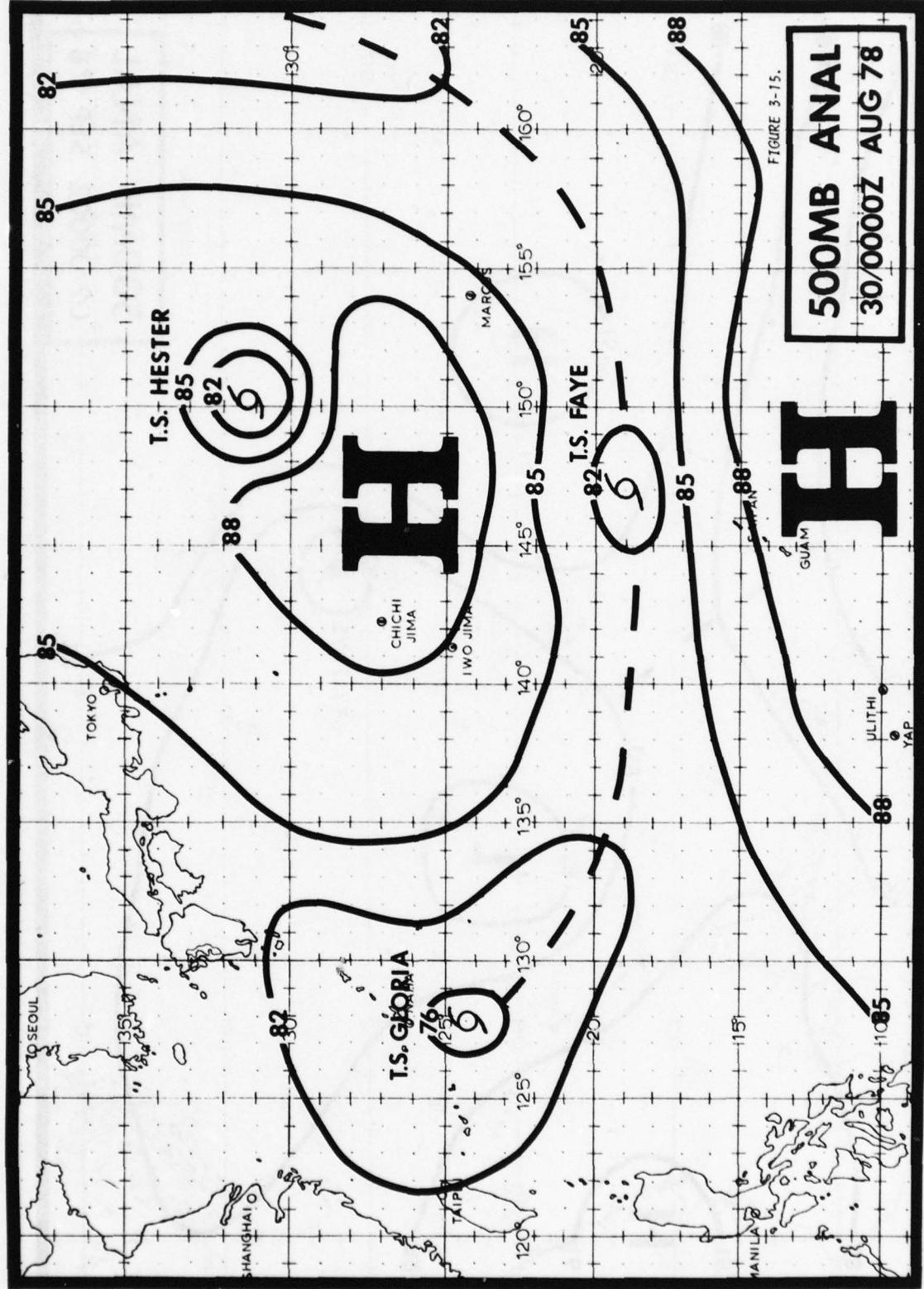
Faye reached the southernmost point of her looping track at 010000Z September and six hours later was upgraded to typhoon strength based upon the development of a poorly defined eye and a central pressure drop to 984 mb as reported by reconnaissance aircraft. At 020000Z September, the 500 mb pattern again changed radically (Fig. 3-16). Ridging, albeit weak, now dominated the Pacific east of Faye. Troughing, enhanced by a long wave east of Japan dominated the Pacific west of Typhoon Faye. Faye was now under the influence of southeasterly steering flow and began tracking steadily north-northwestward around the western periphery of the ridge.

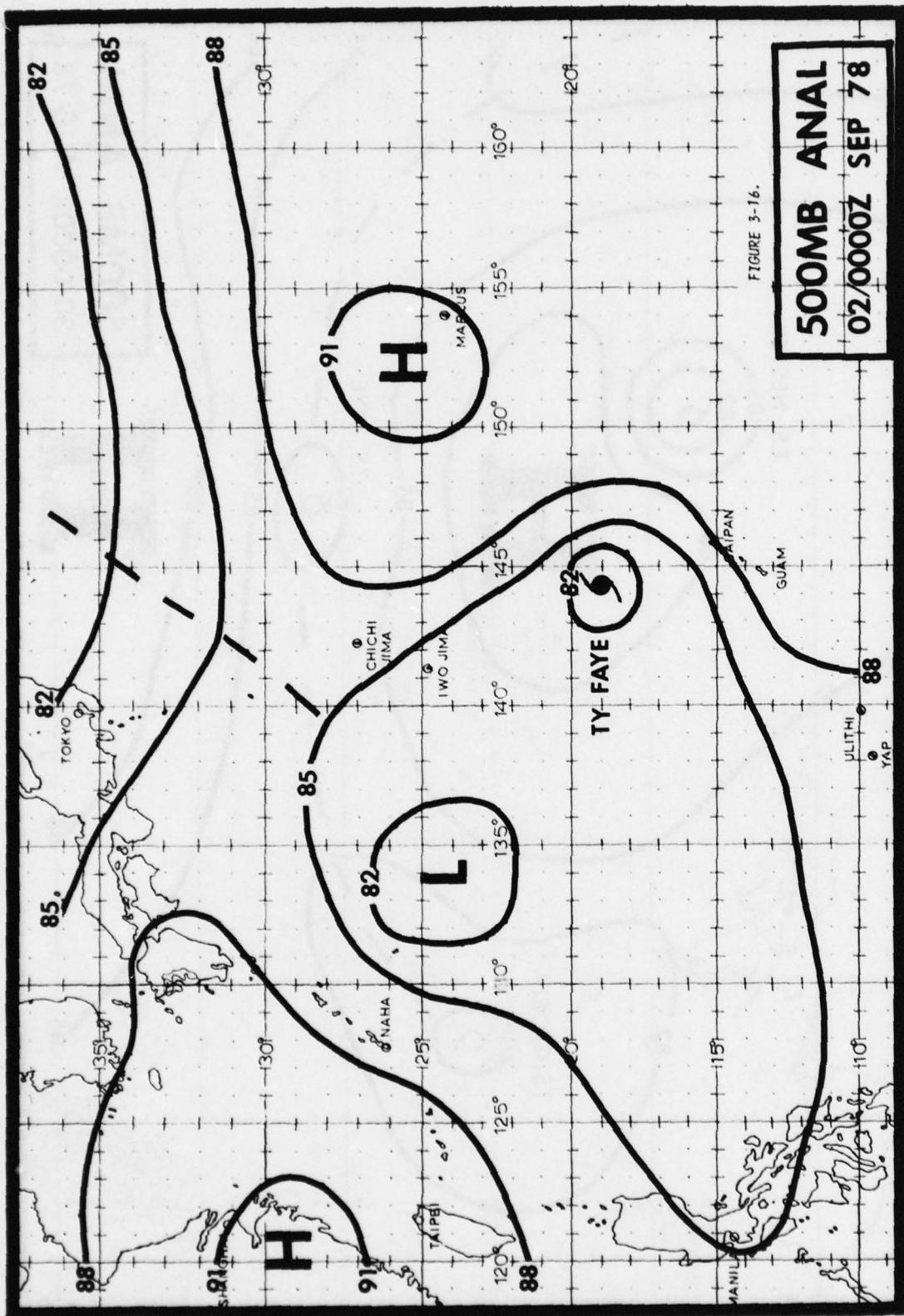
As the ridge strengthened, Faye accelerated from 8 kt (15 km/hr) to 16 kt (30 km/hr) by 031200Z. Thereafter she began to decelerate again and weaken as she approached the axis of the mid-tropospheric subtropical ridge. By 041800Z, Faye



500MB ANAL
30/0000Z AUG 78

FIGURE 3-15.





weakened to tropical storm strength and within six hours had crossed the ridge axis and began to recurve to the northeast.

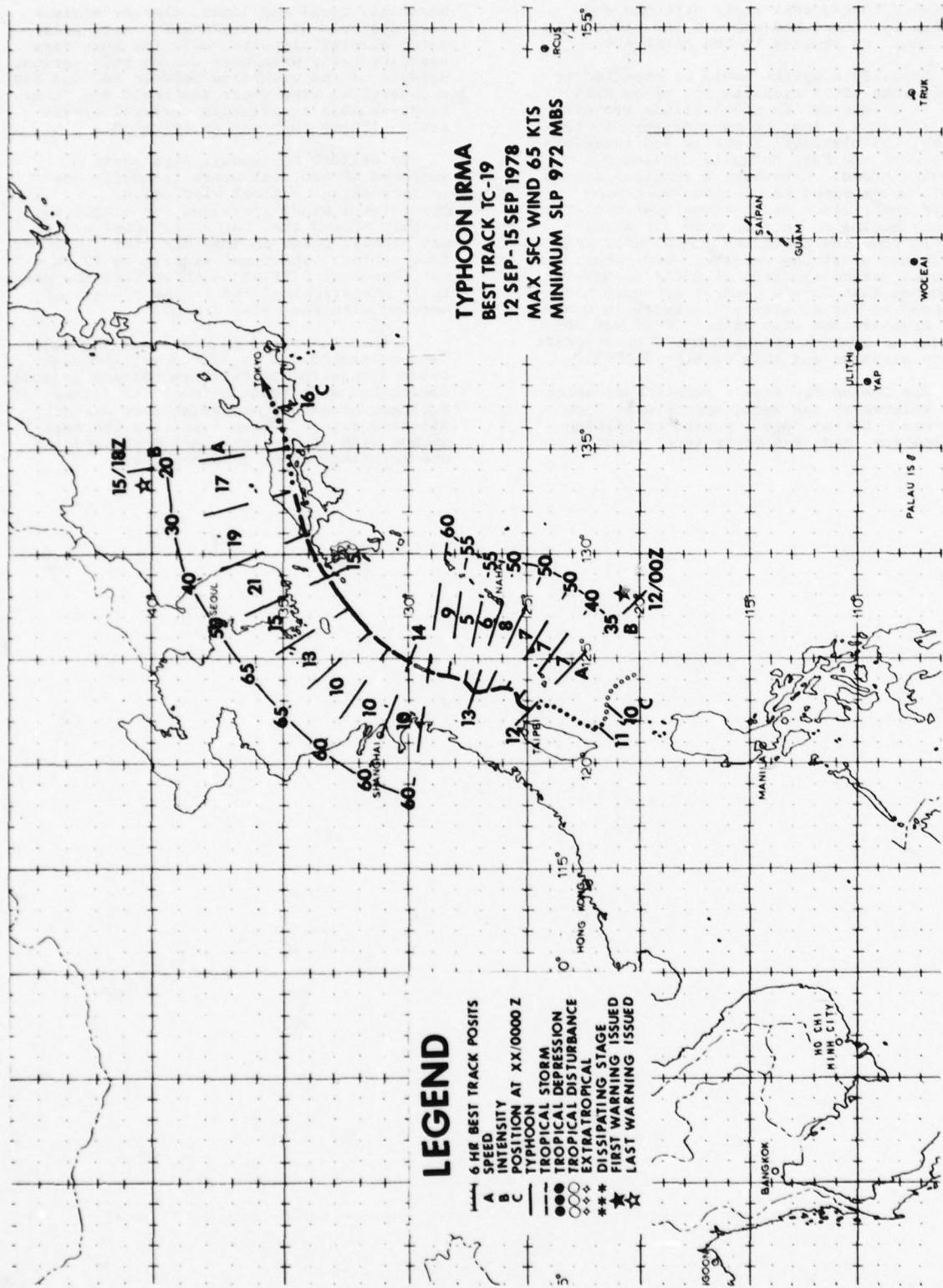
Normally a system would be expected to accelerate after crossing the ridge axis, but in this case the mid-latitude westerly jet stream was located considerably to the north; the mid-level steering was therefore very weak and Faye actually continued a slowing trend. Likewise, a tropical system would be expected to continue weakening after recurvature as it moves over cooler water, begins to entrain cold air at mid-levels from the north and comes under the influence of strong vertical wind shear. A reconnaissance aircraft at 050541Z, however, reported that Faye's central pressure had dropped to 975 mb with an increase in overall organization also noted. Faye was upgraded to typhoon strength based on aircraft reconnaissance and ship data at 051800Z.

The reason for Faye's reintensification was related to the weak, upper-level flow pattern. During Faye's period of reintensification, mid- and upper-level winds were

basically zonal and light, thereby minimizing the cold air entrainment. Reconnaissance aircraft reports indicated that Faye was distinctly warm core during this period. Because of the weak flow between 500 and 200 mb, vertical wind shear was small and, thus, Faye was able to maintain vertical organization longer than was anticipated.

By 061200Z September, Faye again weakened to tropical storm intensity due to increasing vertical wind shear. Upper-level winds increased and satellite imagery showed that her upper-level center was finally being sheared off from the surface center. The final warning on TS Faye was issued at 071800Z at which time she was fully extratropical and in the process of merging with the polar front.

Although Typhoon Faye avoided the major land masses of the Pacific area, she did cause damage to the Northern Mariana Islands. During her anticyclonic loop, the islands of Agrihan, Alamagan, and Pagan were directly affected twice. Pagan sustained the most damage with sixty-five homes destroyed and one merchant vessel grounded.



TYPHOON IRMA

Irma, the eighth typhoon of the 1978 season, developed in the monsoon trough southeast of Taiwan. Located in the Luzon Straits over the previous week, the monsoon trough slowly drifted northward and a weak surface circulation became evident southeast of Taiwan on the 11th. The monsoon trough at 500 mb was also observed to have shifted well northward signifying the trough becoming vertically aligned with the surface circulation. This northward shift also moved the monsoon circulation under favorable outflow aloft. The mechanism for rapid tropical cyclone development being present, numbered warnings began without the issuance of a formation alert.

Aircraft reconnaissance, at 0935Z on the 12th, confirmed TD-19 had undergone rapid development. Post analysis determined that the cyclone reached tropical storm strength at 120000Z. Due to the lack of a strong subtropical high pressure ridge to the north of Irma and the fact that the southwest monsoon flow was more intense than the easterlies north of the monsoon trough, Irma moved northeast. Then, on the 13th at 1800Z, Irma began accelerating northeastward as mid-level steering strengthened when a short-wave, westerly trough tracked eastward off China. Diffidence aloft, ahead of the short-wave, allowed Irma to reach a maximum intensity of 65 kt (33 m/sec) by 141200Z.

Irma remained a typhoon for only 12 hours becoming the shortest-lived typhoon of the season. The 140000Z, 500 mb analysis indicated that Irma was north of the broad subtropical ridge axis, building in behind her, and she was accelerating northeastward. Her

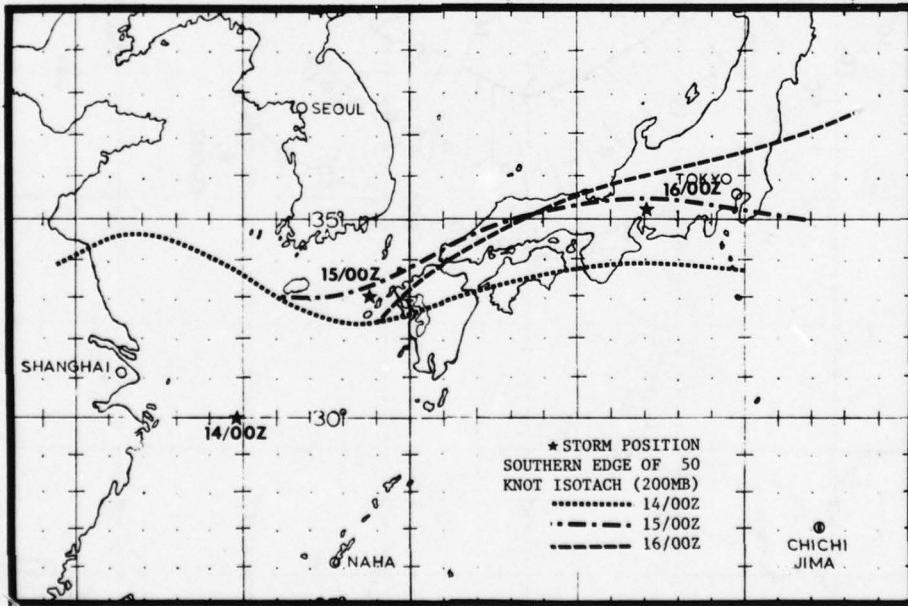
maximum forward speed of 21 kt (39 km/hr) was obtained while tracking through the Tsushima Straits prior to making landfall on Honshu.

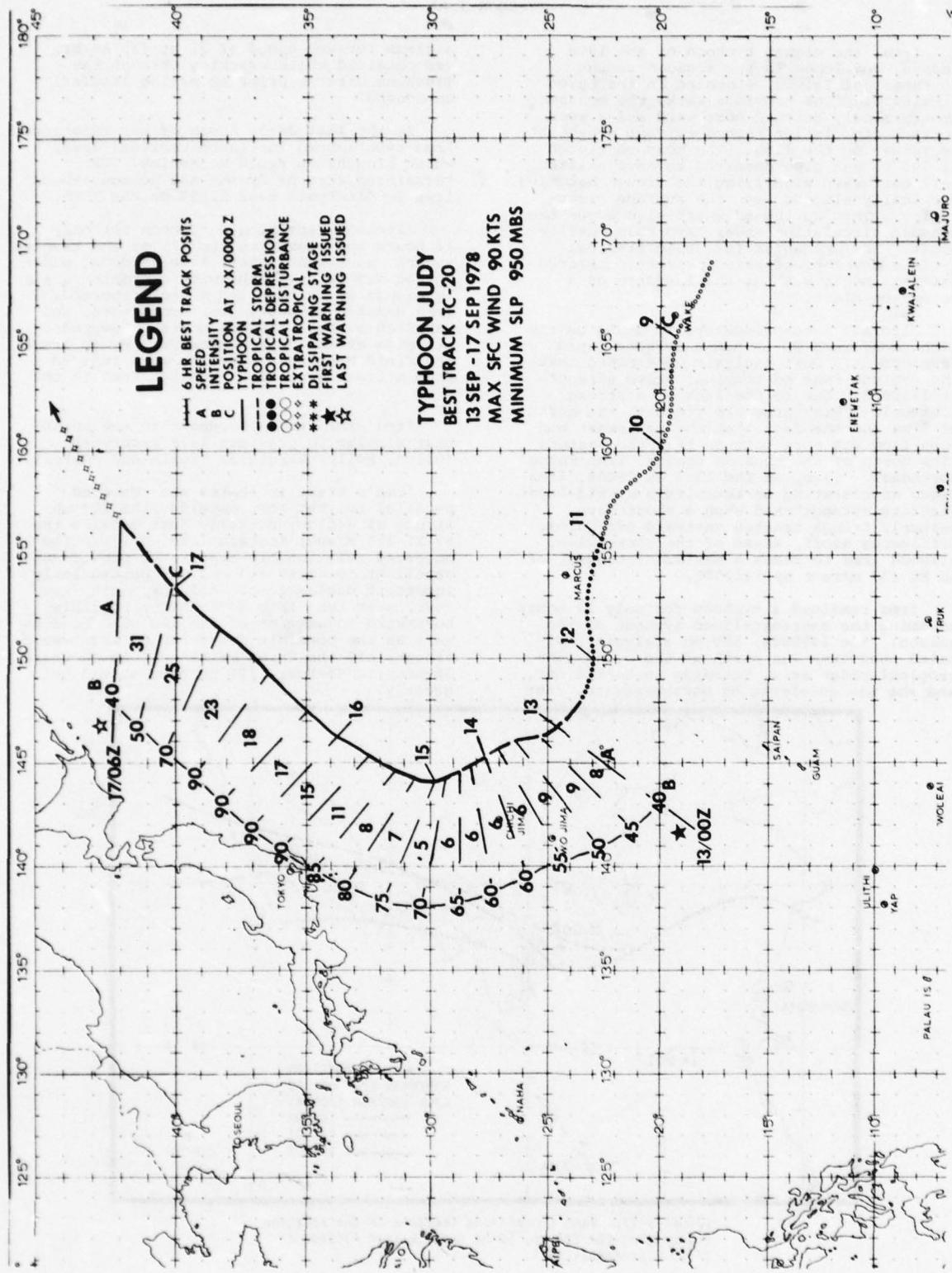
In the last 24-36 hours of her existence, Irma experienced increased vertical shear which brought on rapid weakening. The terrain effects of Kyushu and Honshu caused Irma to dissipate near 1200Z on the 15th.

Although remaining a typhoon for only 12 hours and weakening rapidly as she tracked towards southwest Japan, Irma produced widespread damage to Kyushu with estimated gusts in excess of 100 mph (45 m/sec) reported. Irma smashed windows, overturned cars, and capsized several fishing boats. Several athletes at the Japan-China Friendship Track and Field Meet in Kitakyushu were injured when a freak gust blew them ten feet in the air.

Irma exhibited a movement to the northeast similar to previous 1978 recurvers (Olive, Polly, Virginia, Gloria and Hester).

Irma's track indicates she traveled parallel to, but just outside, the 200 mb strong wind flow; actually just outside the 50 kt (26 m/sec) isotach (Fig. 3-17). The observed relationship appears to provide an excellent forecast aid and was particularly important during Irma. All forecasts, however, must take into account the possible northward adjustment of the max wind band as well as the possible deepening of short-wave troughs off the China mainland. An accurate 36-hour to 48-hour, 200 mb prog should help greatly.





TYPHOON JUDY

Typhoon Judy was first evident on satellite imagery as an area of convective activity in the easterlies. Further evidence of the initial disturbance was provided by surface observations from Wake Island during the period of 081200Z to 090000Z September 1978 showing a wind shift, maximum sustained winds of 20 kt (10 m/sec), and a minimum sea level pressure of 1005 mb. For the next three days, the disturbance was monitored by satellite reconnaissance and discussed in the Significant Tropical Weather Advisory (ABEH PGTW). Based on September's climatology for disturbances north of 20N latitude, potential for development was considered to be poor. At times during this period, this potential was supported by satellite imagery showing weak vertical development associated with the disturbance (Fig. 3-18). However, on the 12th, satellite imagery showed increased organization. A Tropical Cyclone Formation Alert was issued as 120440Z and aircraft reconnaissance was scheduled. The first aircraft penetration was 16 hours later and aircraft data along with satellite imagery (Fig. 3-19) supported a cyclone of tropical storm intensity. Consequently, the first warning was issued at 130000Z. Even though Judy was detected very early in her developmental stages, the issuance of an earlier warning was delayed primarily due to a lack of significant skill over climatology in forecasting rapid tropical cyclone development.

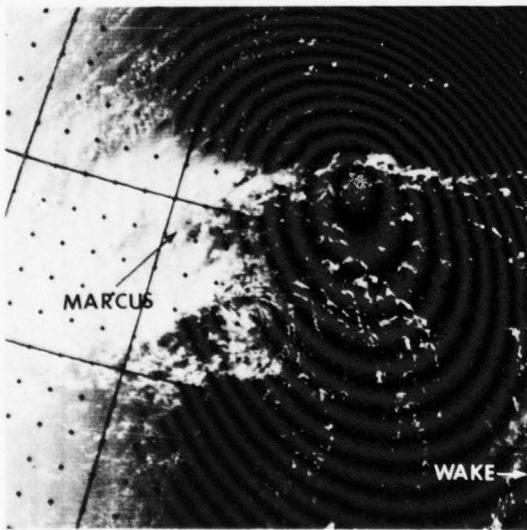


FIGURE 3-18. Tropical Disturbance which developed into Typhoon Judy. At this time the disturbance lacked vertical development, 10 September 1978, 2049Z. (DMSP imagery)

From the time of the first warning until the last, Judy's track was one of classical recurvature, slowing in forward movement to 5 kt (9 km/hr) at the recurvature point and accelerating to 31 kt (57 km/hr) under strong westerly upper-level steering north

of the subtropical ridge axis. Although part of a two-storm situation with Typhoon Irma (Fig. 3-20), Judy never appeared to be influenced by Irma's presence. Warnings on Judy showed excellent continuity. From the second warning on, a recurvature path was forecast. This was due in part to the early detection which provided considerable history in Judy's past track before the first warning was issued. As a result, the forecast errors for Typhoon Judy were considerably better than average for cyclones undergoing recurvature. The intensity forecasts for Judy, however, always lagged her true intensification rate. The maximum intensity of 90 kt (46 m/sec) which Judy attained after recurvature was not foreseen, nor was the rate at which Judy weakened.

At the time of the last warning issued on Typhoon Judy at 170600Z, satellite imagery showed that Judy was merging with an extratropical system to the north. The added influx of energy into this system caused it to deepen rapidly in 12 hours from an estimated 1000 mb to 988 mb with observed 50 kt (26 m/sec) surface winds. During her life, no reported damage was done by Typhoon Judy.

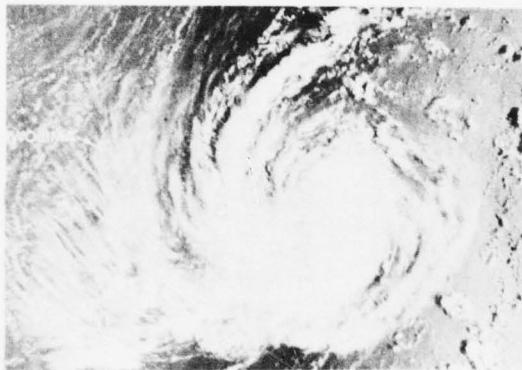


FIGURE 3-19. Judy was at tropical storm intensity at this time, 11 September 1978, 2156Z. (DMSP imagery)

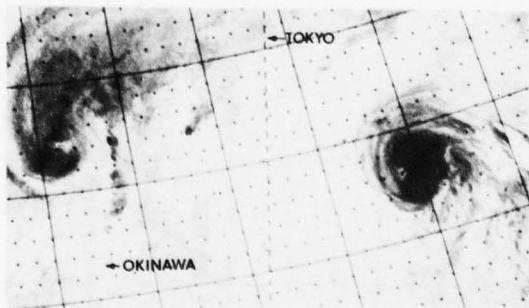


FIGURE 3-20. Infrared imagery of Typhoons Judy (right) and Irma (left), 14 September 1978, 1438Z. (DMSP imagery)

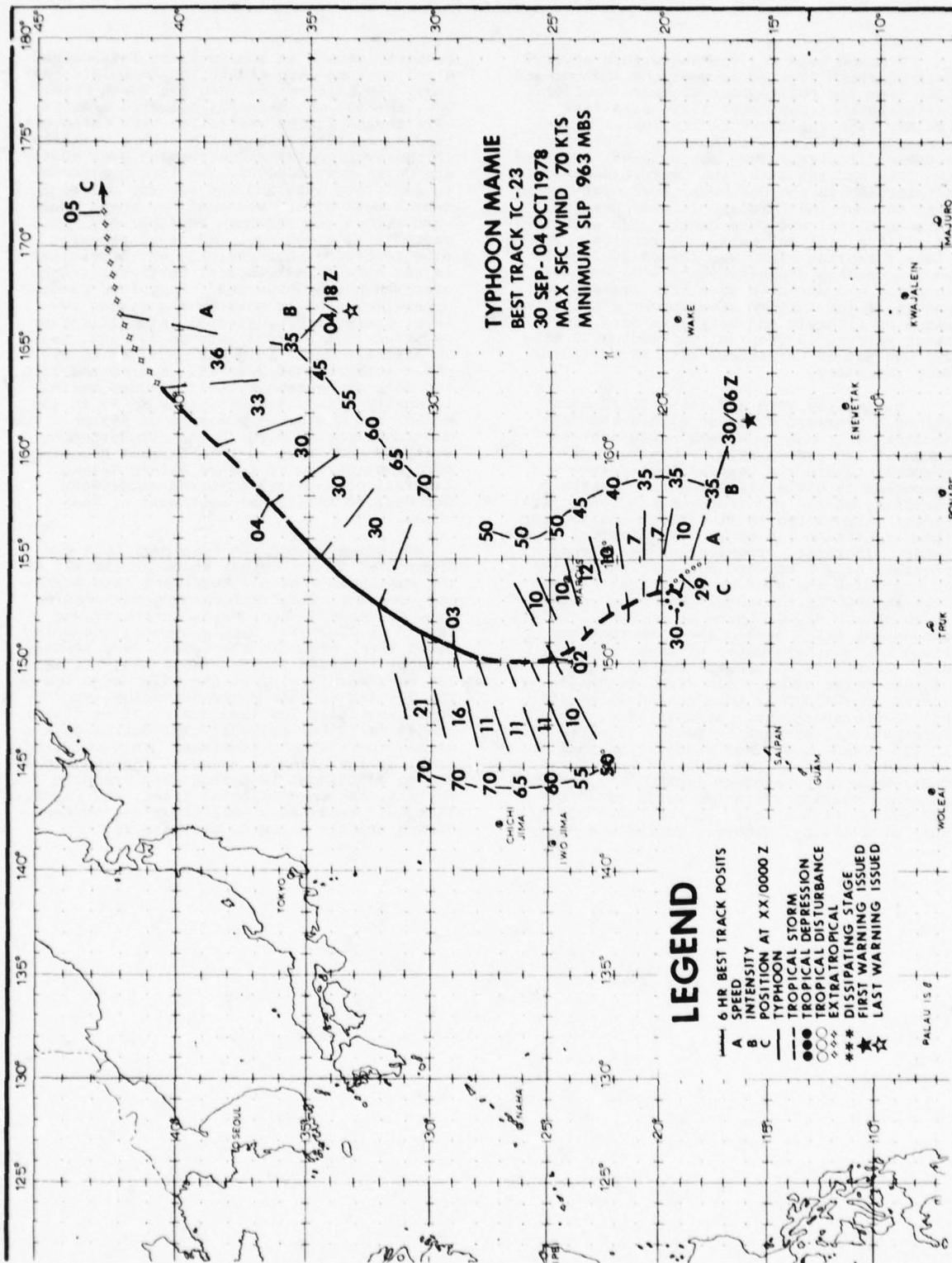
TYPHOON LOLA

Typhoon Lola was spawned within a very active trough located between the equator and 12N, from the Philippines eastward to 150E. On the 20th of September 1978, satellite imagery gave the first indication of a disturbance near 08N-147E; however, a distinct surface circulation was not evident. Between the 20th and the 24th, the disturbance slowly accelerated to the northwest then west-northwest through the Caroline Islands passing between Ulithi and Guam on the 22nd with 15-20 kt (7-10 m/sec) intensity. A tropical cyclone formation alert was issued at 240600Z when increased organization in feeder band activity was noted on satellite imagery and potential for further development was evident. Based on aircraft and satellite data, the first warning on Tropical Depression 22 (TD-22) was issued at 241200Z with 25 kt (13 m/sec) intensity.

During the 24th and 25th, TD-22 maintained a westward movement within the near equatorial trough on a heading 10 degrees north of the trough axis. This westward movement toward the central Philippines was supported by easterlies along the southern periphery of the mid-tropospheric subtropical ridge. Aircraft data at 252100Z positioned the circulation 110 nm (205 km) east of Samar. Increased organization and a central pressure of 995 mb were noted which resulted in upgrading the system to Tropical Storm Lola at 260000Z. Landfall was made on the southeastern tip of Luzon at 261500Z. Lola's subsequent track during the 27th took her along the southern coast of Luzon passing over the cities of Legaspi and Batangas. The closest point of approach (CPA) to Manila occurred at 271000Z as Lola passed 35 nm (65 km) to the southwest. At this time, the International Airport at Manila reported 30 kt (15 m/sec) sustained winds with gusts to 50 kt (26 m/sec). The Naval Weather Service Environmental Detachment (NWSED) at Cubi Pt. recorded maximum sustained winds of 40 kt (21 m/sec) with a peak gust of 59 kt (30 m/sec) at 271241Z. Nineteen deaths and heavy

property damage in the southern Tagalog and Bicol regions were attributed to Lola's passage. As Lola exited into the South China Sea, the 500 mb analysis indicated a short wave trough in the westerlies over China extending as far south as 27N with a weakness in the subtropical ridge forming over southern China. By 280000Z, the trough extended to 23N along 105E and the subtropical high center east of the weakness had moved eastward across the northern Philippines. This caused Lola's dominant mid-level steering flow to become southeasterly which resulted in her more climatological northwest track over the South China Sea. Supported by good upper-tropospheric outflow and strong low-level energy input, gradual intensification occurred from 271800Z through 301800Z. Based on aircraft data, Lola was upgraded to typhoon intensity at 281800Z. During the 29th and 30th of September, Lola reached maximum intensity with sustained winds of 75 kt (39 m/sec) and a minimum pressure of 963 mb. The mid-tropospheric ridge began strengthening westward resulting in Lola's track becoming more west-northwest toward Hainan Island. Landfall over Hainan occurred at 010900Z October, 10 nm (19 km) southeast of Wenchang.

Weakened by terrain features, Lola was downgraded to a tropical storm at 011200Z as she continued west-northwestward into northern Vietnam. The final warning downgrading Lola to tropical depression intensity was issued at 030000Z. Lola's overall uncomplicated track produced the lowest 24-, 48- and 72-hour forecast vector errors (54, 116 and 139 nm respectively) of the 1978 storm season. The 24- and 48-hour forecast vector errors were especially low (average of 21 nm (39km) and 40 nm (74km) respectively) during Lola's passage over the Philippines. This resulted from the increased accuracy of fix positions due to additional land radar and synoptic reports, the uncomplicated track, and the fact that Lola remained a well-organized system during transit allowing accurate fixing.



TYPHOON MAMIE

Typhoon Mamie was yet another of the compact typhoons of 1978. Mamie was also an open ocean typhoon (i.e., it formed and dissipated over the ocean, and affected shipping lanes) and never really threatened any land stations.

Tropical Depression 23 (Mamie) developed from a wave in the easterlies. On the 27th of September at 0000Z this wave was approximately 100 nm (185 km) east of Guam and was oriented southwest-northeast from 10N to 25N. Within the wave, there were two disturbance areas. The northernmost area eventually developed when it moved under an upper air diffluent region. By the 30th, a compact tropical depression was easily noted on satellite data (Fig. 3-21). Also noted were cirrus cloud streamers showing outflow existed in all quadrants. The first warning on TD-23 was issued immediately thereafter.

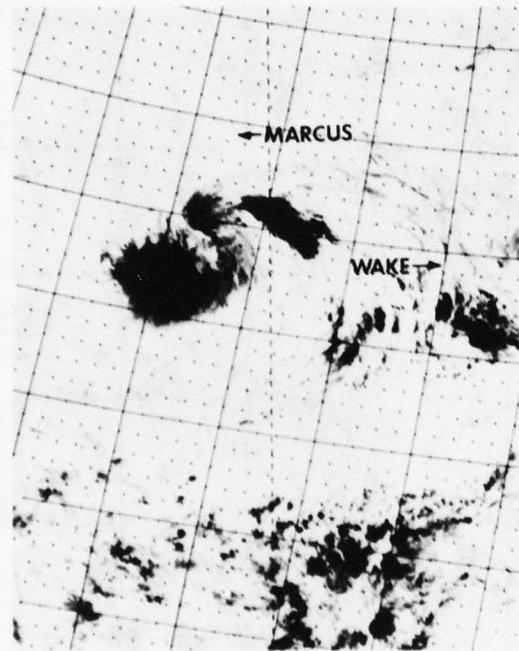


FIGURE 3-21. Infrared imagery of TD-23 (Mamie) at 30 kt (15 m/sec) intensity, 30 September 1978, 0035Z. (DMSP imagery)

Remaining a very compact system (Fig. 3-22), Mamie tracked on a recurvature path along the western periphery of a mid-tropospheric, subtropical high pressure system whose 500 mb height center was near 25N-175E. The direction-of-track forecasts were good; however, the speed-of-movement forecasts were underestimated. Mamie accelerated much more rapidly than expected (twice climatological speeds) after passing north of 30N. Due to sparse, upper-air reports in the vicinity of the typhoon, analysis and forecast aids did not indicate such a rapid acceleration would occur. Mamie eventually weakened and transitioned into an extratropical system on 4 October 1978. Without satellite reconnaissance it is conceivable that the compact, Typhoon Mamie would not have made history.

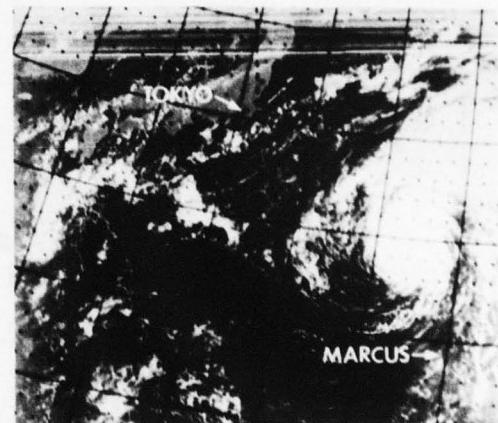
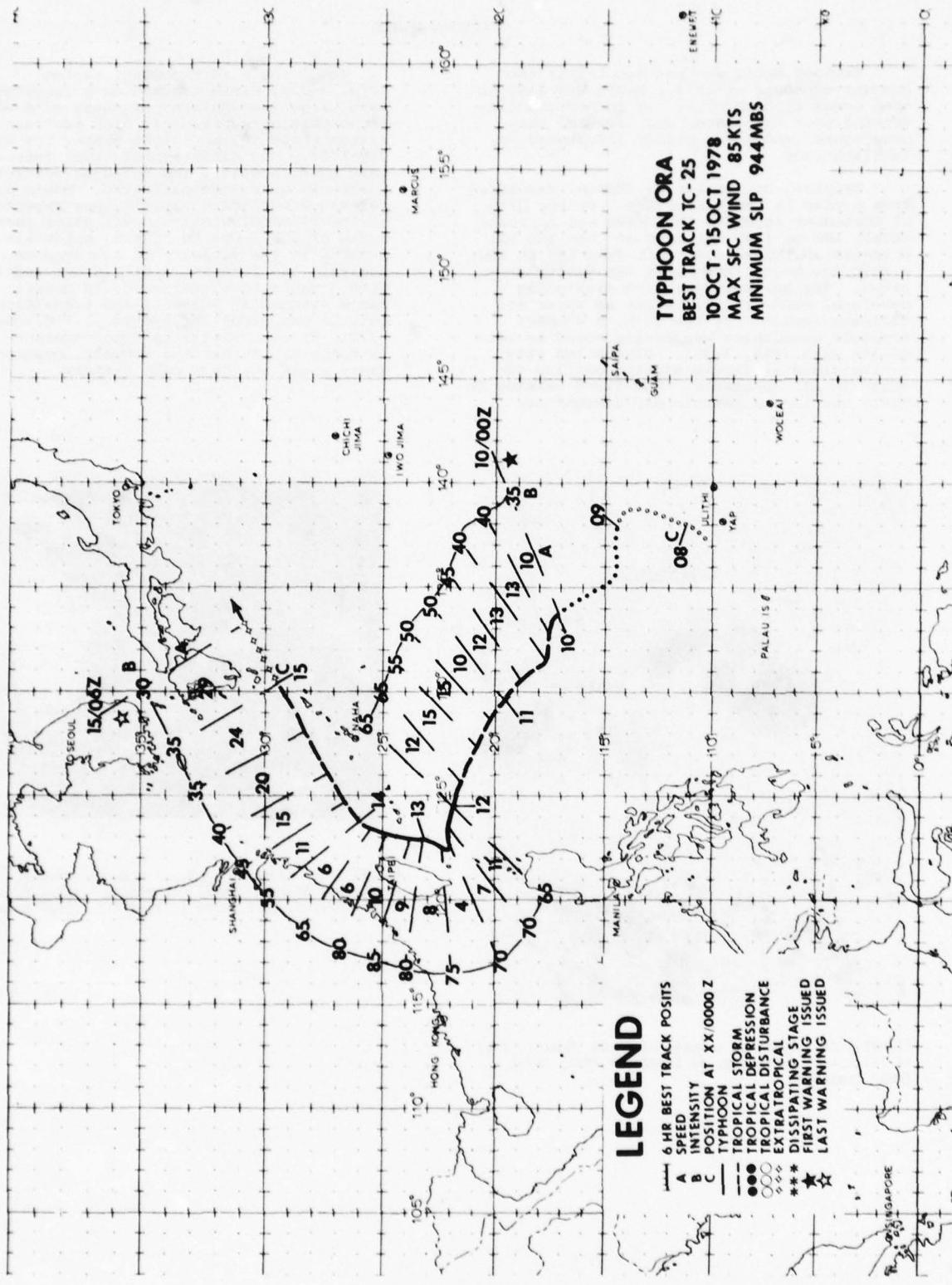


FIGURE 3-22. Typhoon Mamie, remaining compact, moving northeastward while at maximum intensity of 70 kt (36 m/sec), 03 October 1978, 0123Z. (DMSP imagery)



TYPHOON ORA

During the early part of October, extensive monsoon troughing existed from the South China Sea, across the Philippine Islands to an area southeast of Guam. The surface analyses for that period showed a combination of strong northeasterlies north of the monsoon trough axis and well defined cross-equatorial flow into the trough from the Southern Hemisphere. The entire area was, therefore, ripe for continued tropical cyclone development and, indeed, by 081200Z, Tropical Storm Nina was gathering strength east of the Philippines. At about the same time an area of convergence about 300 nm (556 km) west-southwest of Guam began to show increased organization.

JTWC began to monitor this area using satellite and ship synoptic data and issued a Tropical Cyclone Formation Alert at 090707Z. Based on reconnaissance aircraft data at 092254Z October, the disturbance was upgraded to Tropical Storm Ora with the first warning valid at 100000Z October 1978.

The 500 mb analysis at this time showed that the mid-tropospheric subtropical ridge axis was broken between Japan and the Philippine Islands, with a high pressure cell centered over Thailand and another located near Marcus Island. This break was created by a deepening long wave trough that was moving into the western Pacific from the Asian mainland. The circulations of Tropical Storm Nina and Tropical Storm Ora also helped to maintain this break.

Computer aids, climatology and the current synoptic situation supported a northward

track; the JTWC forecast showed Ora recurving to the north-northeast around the western periphery of the high pressure cell that was centered near Marcus Island.

By 101800Z, however, it became apparent that Ora and Nina were beginning to interact. At this time Nina, the dominant system, was trying to force Ora to follow a westward track, while at the same time the long-wave trough, then over the Sea of Japan, was inducing more northward movement. The net effect of these two steering influences caused Ora to follow an overall northwestward track at a speed of 12-15 kt (22-28 km/hr).

On the 11th, it was apparent that Tropical Storm Nina and Tropical Storm Ora were engaging in a Fujiwhara interaction. Nina would have been expected to move eastward in the classic Fujiwhara style. However, because she was the dominant system, the axis of rotation was closer to her. (Figure 3-23 shows the relative positions of Nina and Ora at 112342Z.) Instead of moving eastward, therefore, she merely stalled and then executed two, small loops while causing Ora to move west-northwestward. During this time period, JTWC continued to forecast Ora to cross the southern tip of Taiwan. This forecast was based on persistence and objective forecast aids which had been verifying quite well up to that point. Tropical Storm Ora then began to show increased organization on satellite and radar data. Aircraft reconnaissance at 120304Z reported the first signs of eye formation and a central pressure of 969.6 mb. Post analysis revealed that typhoon intensity was reached at 111800Z.

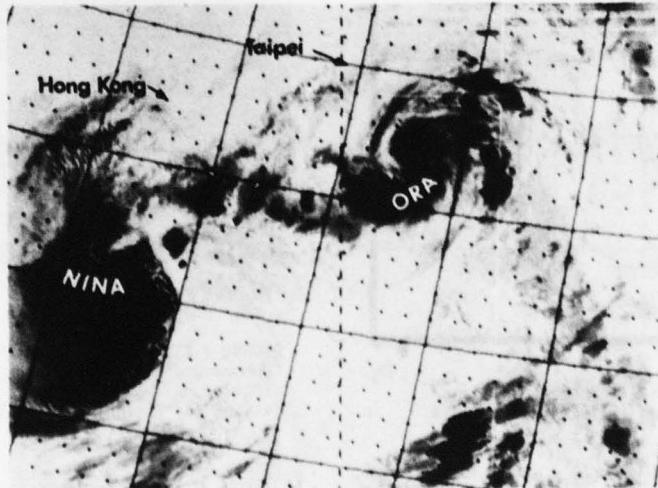


FIGURE 3-23. Infrared image of Typhoon Ora and Tropical Storm Nina during Fujiwhara interaction, 11 October 1978, 2342Z. Post-analysis showed that when the feeder band connecting the two cyclones disappeared, interaction ceased and Ora later turned north. (DMSP imagery)

As Ora approached the east coast of Taiwan, hourly radar fixes from Ishigaki-Shima, Miyako-Jima and Hua-lien indicated deceleration and by 121200Z, Ora had slowed to 4 kt (7 km/hr). By this time, Tropical Storm Nina had evidently weakened to the point where she no longer had any major influence on Ora's movement. The break in the ridge axis then became the controlling factor in determining Ora's track. Westward movement was forecast, in keeping with the upper-air, numerical progs that showed the ridge building back. Fortunately for Taiwan, this ridge failed to build back and Ora veered sharply to the north never making landfall on Taiwan (Fig. 3-24). When unexpected, northward movement was noted, an amended forecast was issued. Without constant reconnaissance, it

is conceivable that the change in Ora's movement would not have been noticed until the next scheduled, 6-hourly fix.

Ora reached her peak intensity of 85 kt (44 m/sec) near 130600Z October as a compact typhoon (Fig. 3-25). By 131800Z, however, reconnaissance aircraft indicated that her central pressure had increased rapidly (44 mb in 17 hours) and there was evidence that her upper level center was beginning to shear off. By 140000Z Ora had weakened to tropical storm strength and was accelerating to the northeast under the influence of strong mid-level westerlies. Tropical Storm Ora then merged with the polar front and was fully extratropical by 150600Z October.

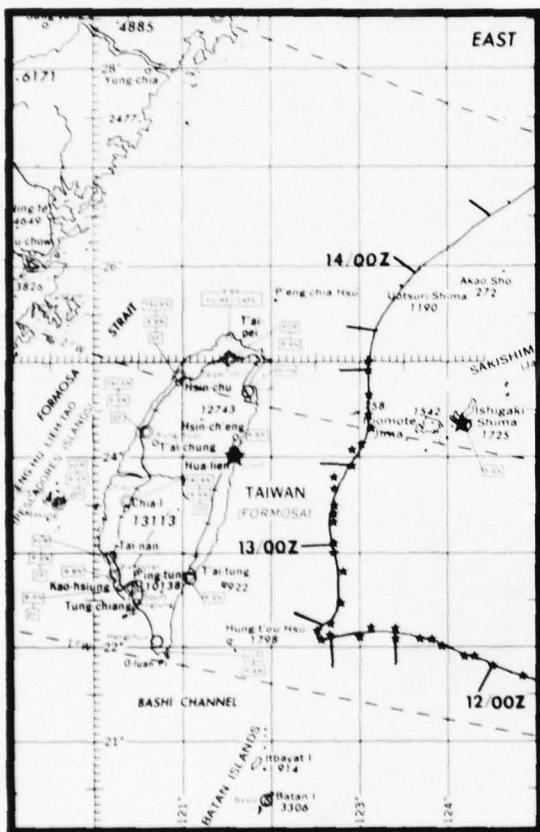


FIGURE 3-24. Hourly radar fixes show Ora's sudden turn to the North after 121200Z October 1978.

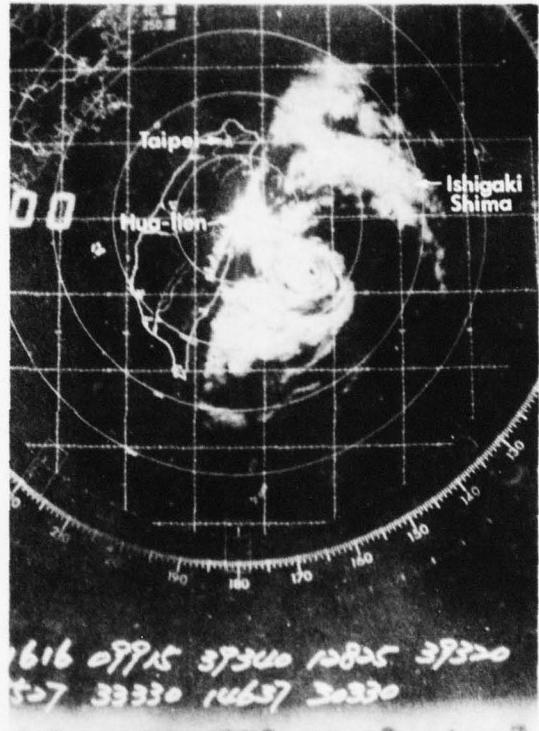
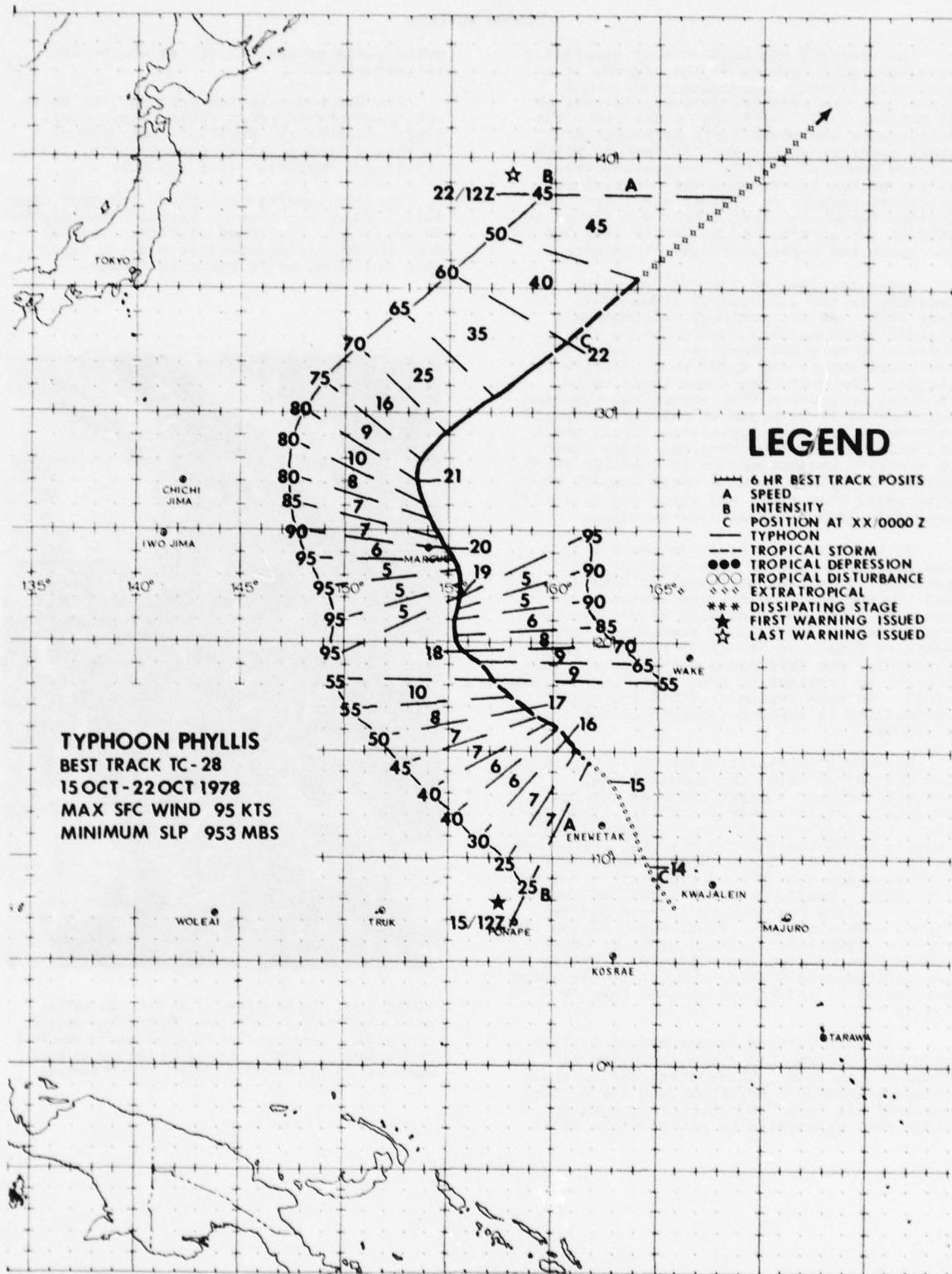


FIGURE 3-25. Hua-Lien radar presentation of Typhoon Ora at 130100Z October just prior to her reaching maximum intensity. [Photograph courtesy of the Central Weather Bureau, Taipei, Taiwan.]



TYPHOON PHYLLIS

The tropical disturbance that eventually developed into Typhoon Phyllis formed in a well established, near-equatorial trough lying over the southern Marshall Islands on 13 October 1978. By 1200Z on the 14th, the disturbance had moved north-northwest and under moderate upper level divergence which existed south of a TUTT. Increased organization of the disturbance was observed on satellite imagery at 142108Z and a Tropical Cyclone Formation Alert (TCFA) was issued at 142235Z for an area 100 to 350 nm (185-556 km) north and north-northwest of Enewetak.

Upper-air data at 150000Z suggested a weakness in the subtropical ridge (STR) axis near 155E. As the tropical disturbance tracked northwestward toward the weakness, increasing vertical organization between low-level inflow and upper-level outflow continued. The disturbance was upgraded to tropical depression (TD) status and numbered warnings on TD-28 began at 151200Z. Phyllis remained a tropical depression for 18 hours and was upgraded to a tropical storm based on aircraft reconnaissance information which indicated Phyllis to be a small compact storm with small wind radii and therefore virtually invisible from synoptic reports alone.

By the 16th, the break in the STR axis was well established. The dominant high pressure center was northeast of Wake Island and the secondary center was southwest of Iwo Jima. The dominant high slowly strengthened causing Phyllis to accelerate northwestward from 6-10 kt (11-19 km/hr). Simultaneously, the TUTT moved northward allowing Phyllis to continue to have excellent outflow aloft. In this regime, Phyllis gradually intensified to typhoon strength by the 17th at 1800Z.

When Phyllis finally reached the break in the STR on the 18th, the dominant high weakened leaving a large col area causing Phyllis to drift slowly for a day. Then on the 19th, the high pressure system east of Phyllis began building to the west which eventually caused Phyllis to slowly accelerate northwestward and delayed recurvature for two more days. Cooler waters and reduced, upper-level outflow weakened Phyllis as she re-curved northeastward. Then, north of the STR, Phyllis rapidly accelerated under stronger-than-expected steering currents. Phyllis accelerated from 9 kt (17 km/hr) at the ridge axis to 45 kt (83 km/hr) in less than 30 hours.

Increased vertical shear caused Phyllis to weaken to tropical storm intensity by 0000Z on the 22nd. Thereafter, the pressure gradient between a major surface low moving eastward off Japan and the strong surface ridge east of Phyllis helped maintain storm

force winds around Phyllis as she became extratropical.

The STR built westward as Phyllis began her track toward recurvature (Fig. 3-26). After recurvature, Phyllis' forward speed increased dramatically; extratropical transition was complete after 220600Z.

Phyllis remained a typhoon for four days during which her closest approach to land was 40 nm (74 km) northeast of Marcus Island. Her compactness and over-open water track resulted in no major reported damage.

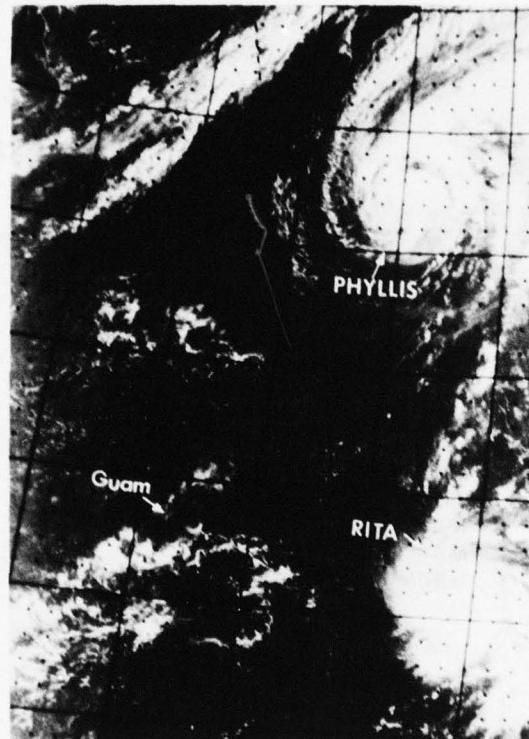
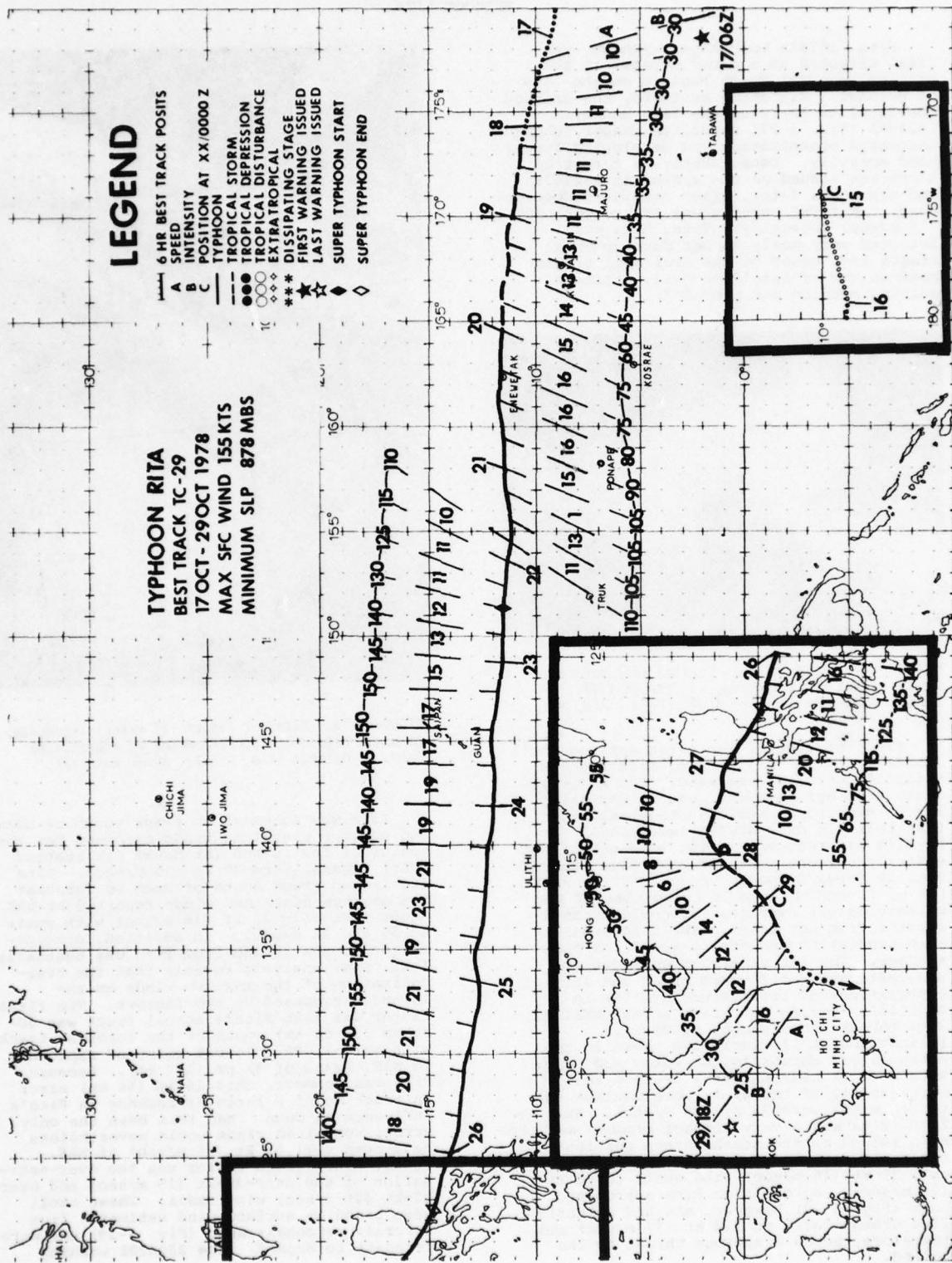


FIGURE 3-26. Typhoon Phyllis at her recurvature point, Typhoon Rita on a track toward Guam and the STR builds in between them as noted by the weakness in the band of showers connecting the two compact typhoons, 21 October 1978, 0106Z. (DMSP imagery)



TYPHOON RITA

Rita, 1978's only super typhoon, was first detected as a cloud cluster in the tropical central North Pacific on the 14th of October. Migrating westward, she crossed the dateline early on the 16th and by 162300Z (Fig. 3-27) satellite imagery showed increased organization and developing feeder band activity. Consequently, a formation alert was issued on the system at 162347Z and six hours later, after continued development, the first warning was issued with 30 kt (15 m/sec) intensity. Thus, Rita was detected very early in her developmental stages and, based on the availability and maximum use of satellite data, a timely warning service was provided.

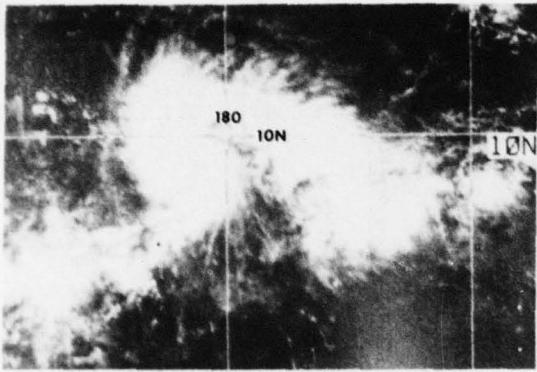


FIGURE 3-27. Rita, as she appeared just before issuance of her first warning, 16 October 1978, 2245Z. (DMSP imagery from AFGLC, Offutt AFB, NE)

From the time of the first warning until landfall on the Philippines, Rita tracked virtually straight westward. The major influence on her movement was the unusually strong mid-tropospheric subtropical ridge that built in over WESTPAC as Typhoon Phyllis was recurring. The strength of the easterly current south of the ridge steered Rita at forward speeds of up to 20 to 23 kt (37 to 43 km/hr); almost twice that of the climatological average. As could be anticipated from her track, JTWC's forecasts were consistent and errors were less than average. The larger errors were due to underestimates of forward speed and initial expectations of recurvature similar to Phyllis'. During her track across WESTPAC, Rita threatened a number of Pacific islands and atolls including those in the northeastern Marshalls, Enewetak and Guam. Rita's track near Enewetak brushed the northern tip of the atoll when maximum sustained winds were 75 kt (39 m/sec). At this time, Rita was a very compact typhoon and the main island on the southeastern portion of the atoll reported maximum sustained winds of only 35 kt (18 m/sec) with gusts to 45 kt (23 m/sec). By the time Rita approached Guam (Fig. 3-28) however, she had intensified dramatically to 150 kt (77 m/sec) and, therefore, posed a serious threat to the island.

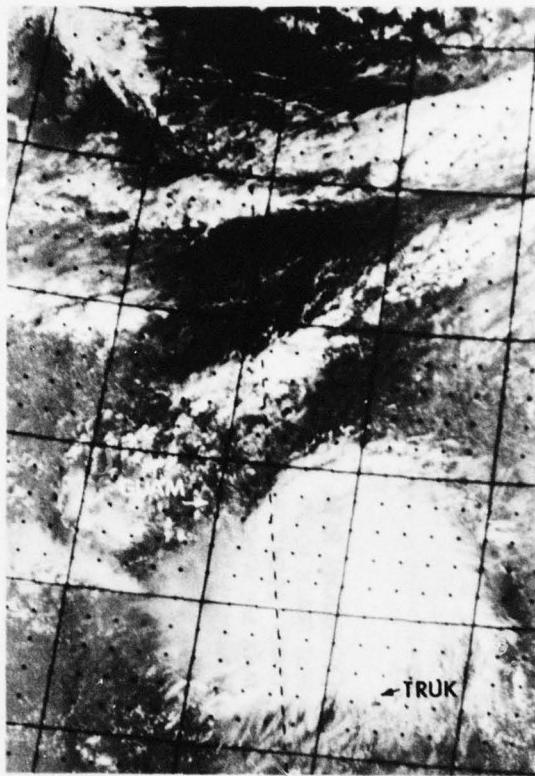


FIGURE 3-28. Rita, at 145 kt (75 m/sec) intensity, 16 hours before her closest point of approach to Guam, 22 October 1978, 2212Z. (DMSP imagery)

Rita was forecast to track south of Guam and maximum sustained winds expected for the center of the island (at Naval Air Station (NAS), Agana) were 70 kt (36 m/sec). Rita did indeed track south of Guam as forecast but maximum sustained winds reported at NAS Agana were only 35 kt (18 m/sec) with gusts to 55 kt (28 m/sec). In addition, precipitation on the island from Rita was unusually low. Post analysis reveals that the over-estimation of the maximum winds on the island was caused by two factors. The first factor was that Rita's actual track was 30-35 nm (56-65 km) south of the forecast track with actual CPA (closest point of approach) to NAS, Agana of 85 nm (157 km). Because Rita was compact, this 30 nm (56 km) error in track meant a large difference in Rita's influence on Guam. Had this been the only error, sustained winds would nevertheless have been over 50 kt (26 m/sec) at NAS, Agana. The second factor was the over-estimation of the over-30-kt (15 m/sec) and over-50-kt (26 m/sec) wind radii. These radii were based on surface wind estimates from aircraft reconnaissance (Fig. 3-29) and were forecast to expand. The 230600Z warning

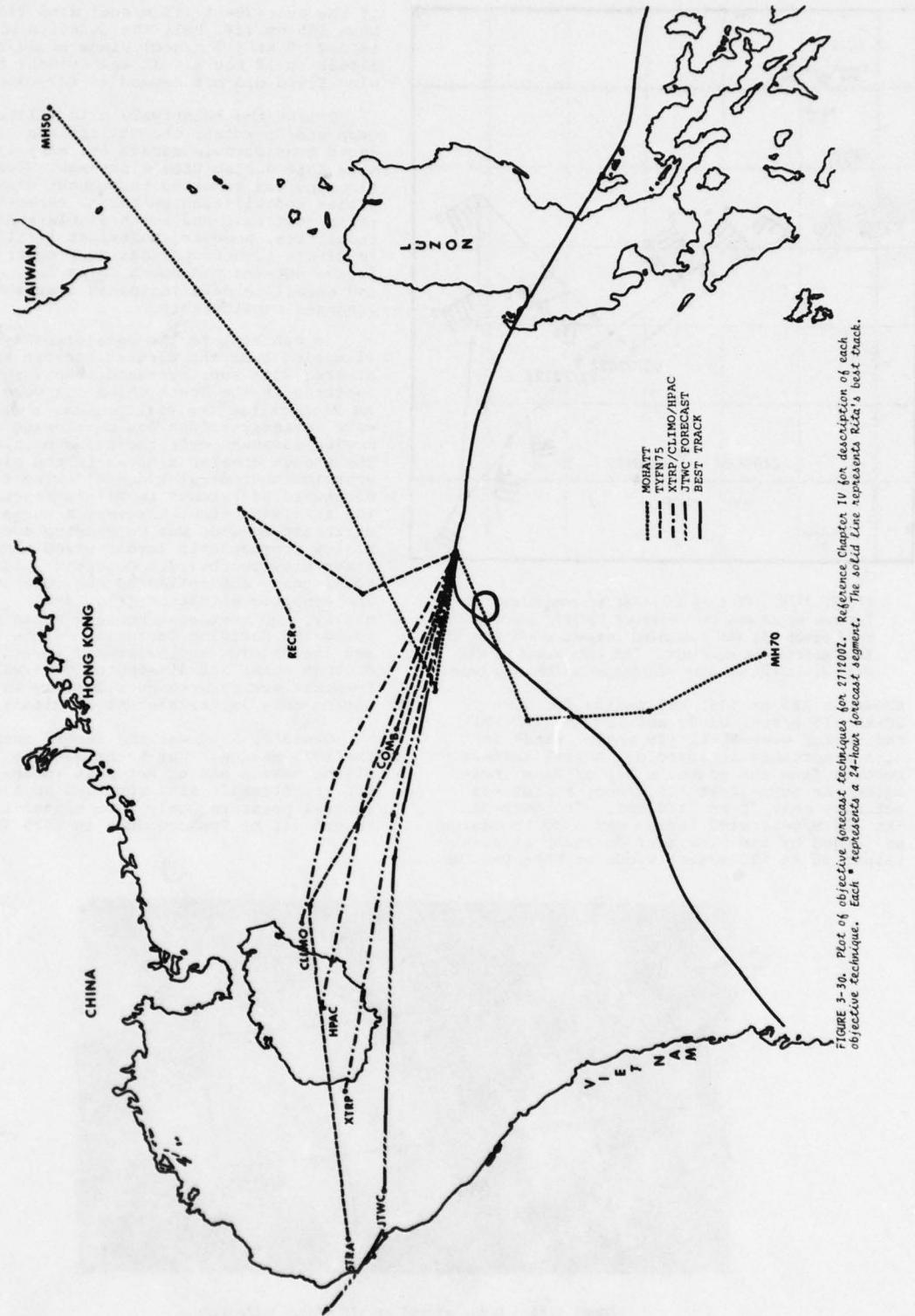


FIGURE 3-10. Plot of objective forecast techniques for 271002. Reference Chapter IV for description of each objective technique. Each • represents a 24-hour forecast segment. The solid line represents Rita's best track.

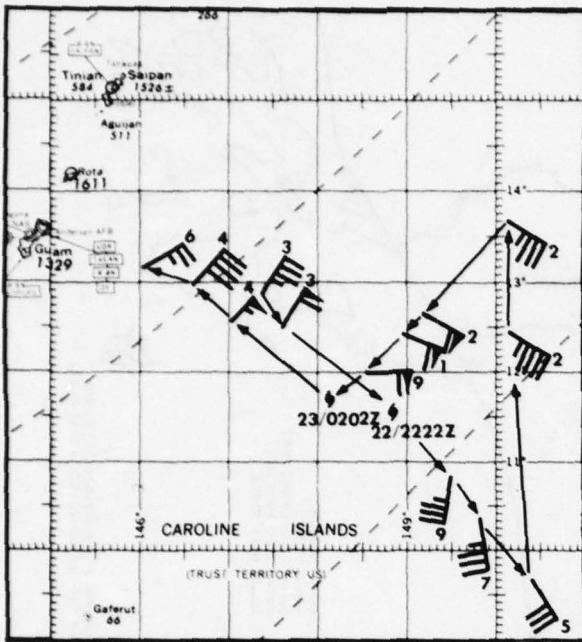


FIGURE 3-29. Plot of aircraft reconnaissance data. Typhoon positions are noted at 230200Z and 222222Z. Wind barbs are the estimated surface winds from the ARWO aboard the aircraft. The tens digit of the wind direction is also plotted with the wind barbs.

Showed a 185 nm (343 km) radius for over-30-kt (15 m/sec) winds and 100 nm (185 km) radius for over-50-kt (26 m/sec) winds in Rita's northern semicircle. Actual surface reports from the southern tip of Guam indicated the over-50-kt (26 m/sec) radius was actually only 70 nm (130 km). The over-30-kt (15 m/sec) wind radius was also too large as judged by the nine hour duration of sustained 30 kt (15 m/sec) winds at NASA Dan Dan.

If the over-30-kt (15 m/sec) wind radius had been 185 nm (343 km), the duration of sustained 30 kt (15 m/sec) winds would have been closer to 19 hours. It was evident that the wind field did not expand as forecast.

Unlike the relatively mild influence on Guam and Enewetak, the Philippines experienced considerable damage and many lives were lost during Rita's passage. Heavy flooding was reported throughout many of the cities and villages on Luzon, especially those just east and north of Clark AB. DoD facilities, however, sustained little damage in Rita's 12-hour passage over central Luzon. As she entered the South China Sea, aircraft and satellite data indicated that she had weakened considerably.

In contrast to the persistent synoptic situation over the Western Pacific which had steered Rita ever westward, the large scale features in the South China Sea were complex. As Rita exited the Philippines, a short-wave westerly trough was developing and moving eastward over the Asian mainland. The trough created a break in the mid-tropospheric subtropical ridge allowing for a northward adjustment in Rita's track. During this same time, however, a surge in the northeast monsoon was developing over China at low tropospheric levels which tended to steer Rita southward. Objective aids lacked consistency and reflected the contrast in the synoptic situation (Fig. 3-30). Eventually, the northeast monsoon surge proved to be the deciding factor in Rita's movement and she tracked southwestward toward the Vietnam coast and dissipated over water. Forecast errors were considerably larger during this latter segment of Rita's track.

Overall, Rita was the record setter for the 1978 season. Her track was the longest of the season and at her peak intensity of 155 kt, aircraft data recorded an 878 mb central pressure, only 2 mb higher than the record set by Typhoon June in 1975 (Fig. 3-31).

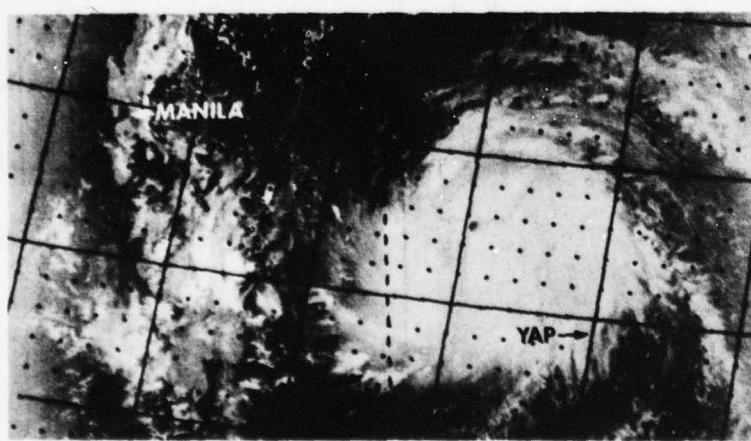
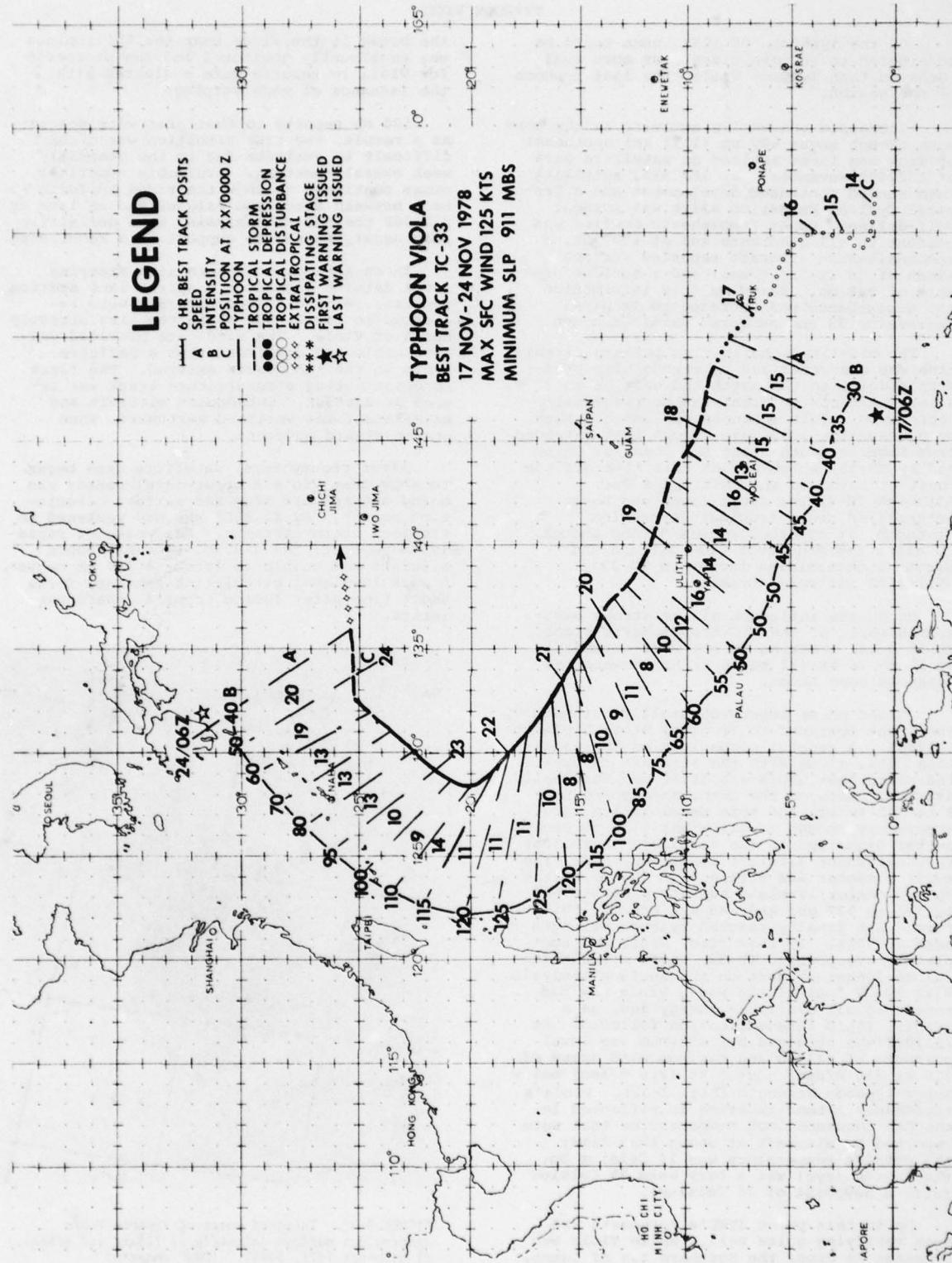


FIGURE 3-31. Rita, at 150 kt (77 m/sec) intensity, 6 hours prior to her peak intensity, 24 October 1978, 2319Z. (DMSP imagery).



TYPHOON VIOLA

Of the typhoons of 1978, none could be considered to be more classic or more well-behaved than Typhoon Viola, the last typhoon of the season.

Increased convective activity in the monsoon trough about 600 nm (1111 km) southeast of Truk was first noticed on satellite data at 132159Z November. By 162142Z, satellite data showed continued development and a Tropical Cyclone Formation Alert was issued. Well-defined, upper atmospheric outflow was evident in all quadrants and at 170710Z, a reconnaissance aircraft reported surface winds of 30 kt (15 m/sec) and a surface pressure of 998 mb. Based on this information the disturbance was upgraded to Tropical Depression 33 and numbered warnings began.

The mid-tropospheric flow pattern at this time was characterized by strong high pressure ridging to the north and east of TD-33 with a weakness apparent in the ridge axis near Luzon. This weakness was induced both by a deepening long wave trough that extended from Siberia south along the coast of China and by TD-32, which was at this time off the coast of Luzon in the Philippine Sea. Although TD-32 was short-lived and never intensified above tropical depression strength, it nonetheless was strong enough to alter the mid-level flow pattern and become a determining factor in TD-33's (Viola's) ultimate movement.

Under the influence of the strong easterlies south of the mid-tropospheric ridge, TD-33 began tracking to the west-northwest at 12 to 16 kt (22 to 30 km/hr) toward the weakness near Luzon.

Based on an improved satellite signature, TD-33 was upgraded to Tropical Storm Viola at 171200Z. A careful comparison of the satellite data, along with the aircraft reports, indicated that Viola was still not vertically stacked. Late on the 19th, she slowed to 8 kt (15 km/hr) and this deceleration was apparently enough to allow her time to become better organized in the vertical. A 191505Z reconnaissance aircraft confirmed that: the surface center was within 5 nm (9 km) of the 700 mb center; Viola's surface pressure had fallen to 977 mb; and, an eye was beginning to form. She finally reached typhoon strength near 200000Z. By this time, Viola had completely overpowered TD-32, whose circulation was no longer evident on the surface analysis. With TD-32 "out of the way", Viola now had access to all available energy and, as a result, rapid intensification followed. At 211200Z she attained her minimum sea level pressure of 911 mb and maximum wind speed of 125 kt (64 m/sec) just 5 kt (2.6 m/sec) below super-typhoon strength (Fig. 3-32). Viola's tremendous intensification is reflected in the ten thousand foot temperatures that were reported by aircraft at about that time; the outside temperature was 14 Celsius but the inside (eye) was a very warm 29 Celsius (with a dewpoint of 16 Celsius).

Up to this point JTWC's forecasts had been verifying quite well. While Viola was forecast to cross the northern tip of Luzon,

the break in the ridge near the Philippines was continually monitored and the prospects for Viola to recurve were evaluated with the issuance of each warning.

500 mb reports in that area were sparse; as a result, the true situation was often difficult to evaluate due to the generally weak overall pattern. Available numerical progs continued to show the ridge building back between Luzon and Taiwan, and as late as 210000Z the 500 mb analysis, more definitive than usual, seemed to support this rebuilding.

In an attempt to obtain more steering level data to augment the sparse land station reports, reconnaissance aircraft were requested to fly at 500 mb in the area directly north of Viola. The wind data provided was invaluable and confirmed that a definite break in the ridge axis existed. The first forecast noting a recurvature track was issued at 220600Z. Subsequent aircraft and satellite fixes verified northward, then northeastward movement.

After recurvature, satellite data began to show that Viola's upper-level center was being sheared off from her surface circulation center. By 231800Z she had weakened to tropical storm strength. She weakened rapidly thereafter; the 2400030Z reconnaissance aircraft was unable to locate a 700 mb center. A weak low-level circulation remained for a short time after losing tropical characteristics.

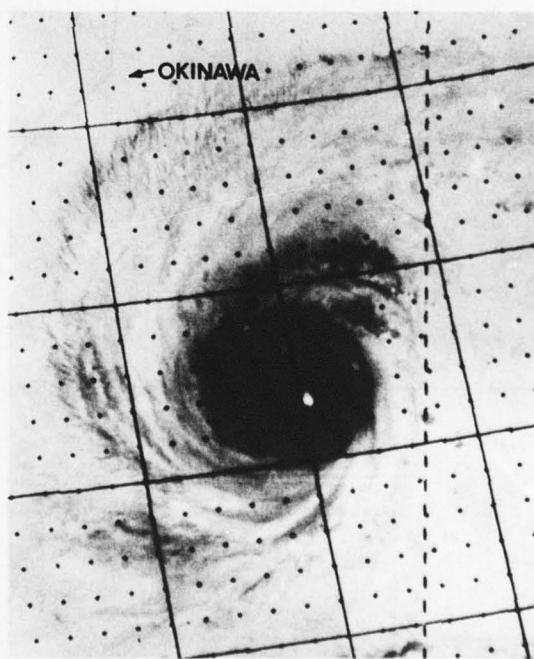


FIGURE 3-32. Infrared image of Typhoon Viola nearing her maximum intensity of 125 kt (64 m/sec), 21 November 1978, 0945Z. (DMSP imagery)

2. NORTH INDIAN OCEAN TROPICAL CYCLONES

During 1978, four significant tropical cyclones occurred in the North Indian Ocean area (Table 3-6). As usual, the transition seasons between the northeast and southwest monsoon periods were the favored "cyclone seasons" (Table 3-7). This year's cyclones lived longer than others on record as noted by the above-average number of warnings shown in Table 3-8.

Tropical Cyclone (TC) 18-78 occurred just prior to the start of the southwest monsoon season over Southeast Asia. Steering flow was weak which caused forecasting the speed of movement to be difficult. The lack of

surface observations forced reliance on the interpretation of satellite data for position and intensity. TC 18-78 made landfall on Burma with estimated, maximum sustained winds of 50 kt (26 m/sec). News reports stated, "the town of Kyaukpyu reported 90% property damage and the coastal village of Narakway was demolished when estimated peak wind gusts of 80 to 100 mph were experienced." These extreme winds, although estimated, could have been produced by squall lines or tornados.

TC 19-78 dissipated prior to making landfall on Bangladesh; no "ground truth" reports were received confirming it's strength.

TABLE 3-6.
NORTH INDIAN OCEAN AREA

CYCLONE	PRD. OF WARNING	CALENDAR DAYS OF WARNING	MAX SEC	EST MIN SLP	NO. OF WARNINGS	DISTANCE TRAVELED		
TC 18-78	15 MAY-17 MAY	3	60	955	4	362		
TC 19-78	26 OCT-28 OCT	3	40	995	7	451		
TC 20-78	06 NOV-11 NOV	6	80	965	12	1213		
TC 21-78	20 NOV-29 NOV	10	95	955	19	1397		
	1978 TOTALS	22			42			

JWS

TABLE 3-7.

FREQUENCY OF NORTH INDIAN OCEAN CYCLONES BY MONTH AND YEAR

YEAR*	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1971	**	**	**	**	**	0	0	0	0	1	1	0	2
1972	0	0	0	1	0	0	0	0	2	0	1	0	4
1973	0	0	0	0	0	0	0	0	0	1	2	1	4
1974	0	0	0	0	0	0	0	0	0	0	1	0	1
1975	1	0	0	0	2	0	0	0	0	1	2	0	6
1976	0	0	0	1	0	1	0	0	1	1	0	1	5
1977	0	0	0	0	1	1	0	0	0	1	2	0	5
1978	0	0	0	0	1	0	0	0	0	1	2	0	4
AVERAGE (1971-78)	0.1	0	0	0.3	0.5	0.3	0	0	0.4	0.8	1.4	0.3	3.9

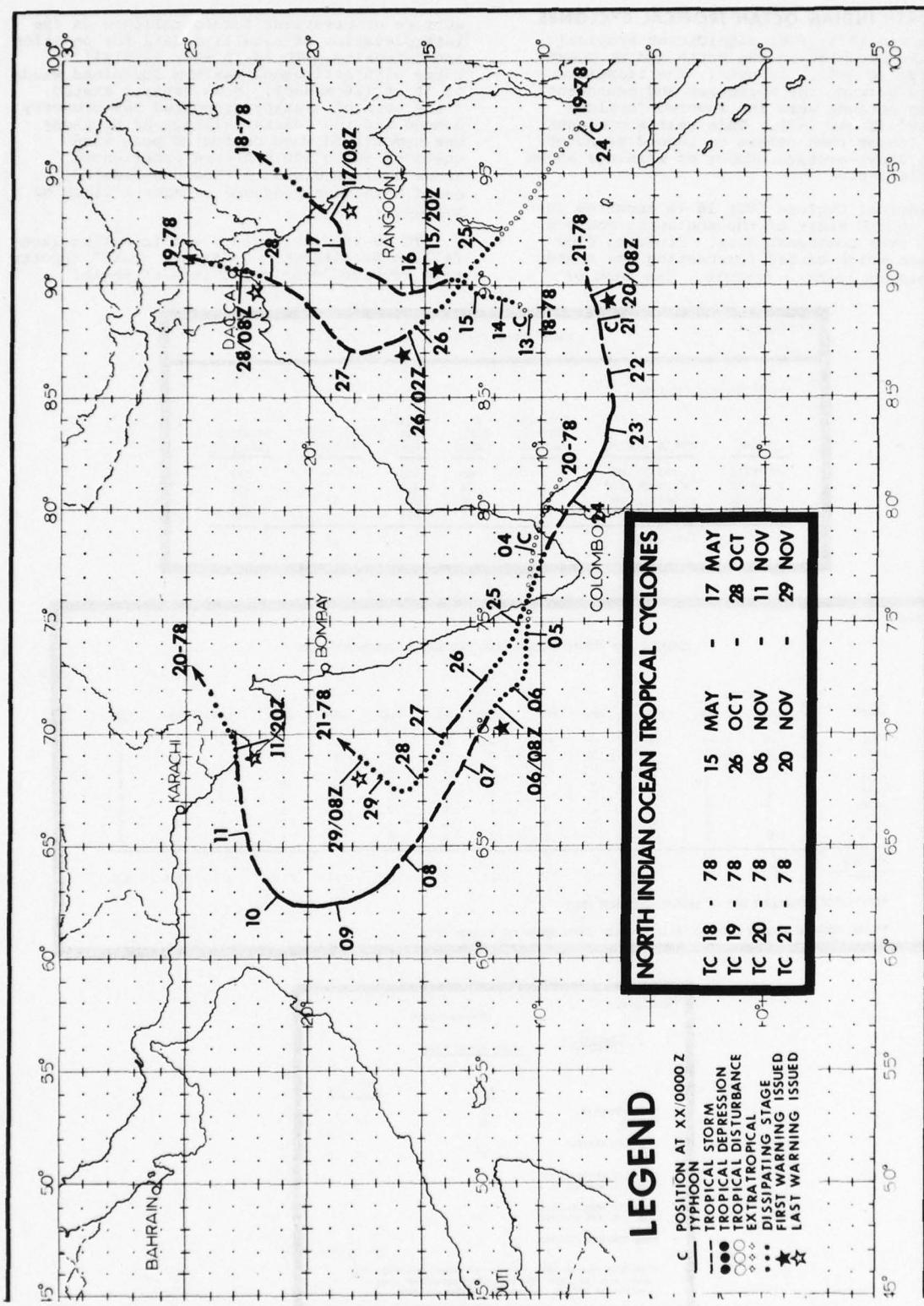
*1971-1974 REPRESENT BAY OF BENGAL CYCLONES ONLY

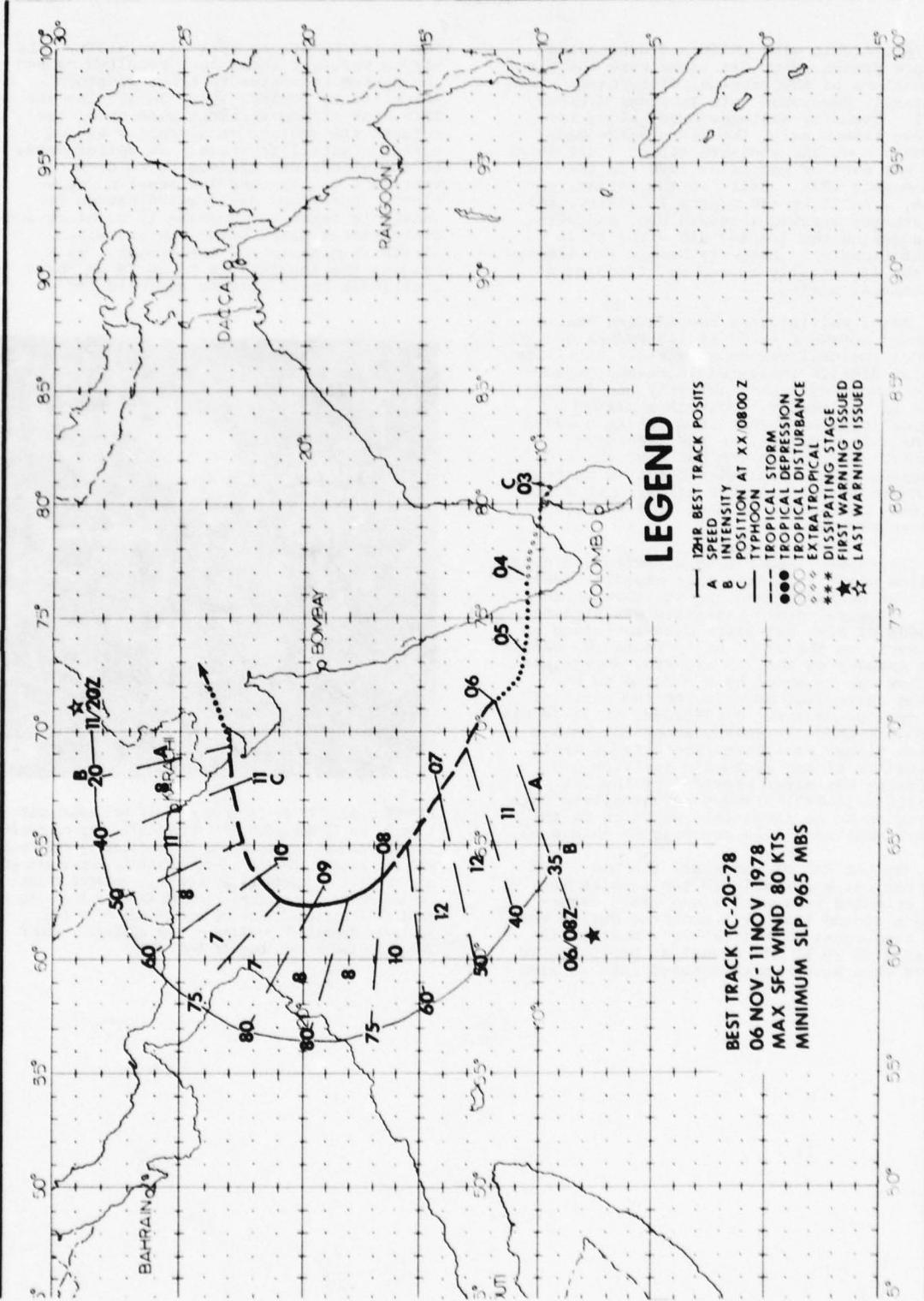
**JTWC RESPONSIBILITY FOR BAY OF BENGAL CYCLONES BEGAN ON 4 JUNE 1971

TABLE 3-8.
WARNING SUMMARY

	1978	AVG. 1971-1977*
TOTAL NUMBER OF WARNINGS	42	29
NUMBER OF WARNING DAYS	22	17
NUMBER OF WARNING DAYS WITH 2 OR MORE CYCLONES	0	2
NUMBER OF WARNING DAYS WITH 3 OR MORE CYCLONES	0	0
TOTAL TROPICAL CYCLONES	4	4

*From 1971 through 1974, only Bay of Bengal cyclones were considered. The JTWC area of responsibility was extended in 1975 to include Arabian Sea cyclones.





(NEW 2-76)

A cyclonic wind shift and decreasing surface pressures on Sri Lanka were the first indications of the tropical disturbance which eventually developed into Tropical Cyclone 20-78. Tracking west-northwest along the monsoon trough axis, the disturbance made landfall over the southern tip of India 66 nm (122 km) east of Madura at 1800Z on the 3rd of November 1978. Still in the formative stage, with 20 kt (10 m/sec) intensity, the disturbance tracked westward over southern India during the 3rd and 4th with little intensification. Property damage was limited to, and essentially caused by, flooding on the coastal plains.

After exiting into the Arabian Sea, a westward movement at 07 kt (13 km/hr) and gradual intensification occurred. Satellite data at 050647Z indicated increased organization and feeder band activity had formed south of the center. JTWC thus issued a Tropical Cyclone Formation Alert at 051239Z as the system moved into the Laccadive Islands. During the 5th and 6th, the mid-tropospheric subtropical ridge axis shifted northward from 16N to 20N allowing TC 20-78 to track more north of west from 051400Z through 082000Z.

Increased feeder band activity and good outflow aloft indicated that steady intensification occurred from the 5th through the 8th. Tropical storm intensity was attained by 060800Z with satellite data revealing an eye early on the 7th. As indicated by satellite imagery on the 7th and 8th, upper-level outflow was enhanced by a channel to the strong westerlies existing to the north of the cyclone center. By 080200Z, TC 20-78 had reached typhoon intensity according to the Dvorak visual satellite intensity analysis. Evaluation of the cyclone's position and intensity estimates provided by the USS LaSalle's (AGF-3) TIROS-N APT satellite data proved to be an invaluable addition to the normal DMSP satellite coverage of this area.

By the 9th of November, the mid-level subtropical ridge axis in the Arabian Sea was oriented east-west along 19N. Recurvature around this axis occurred during the 9th concurrent with TC 20-78's maximum intensity of 80 kt (41 m/sec) at 090900Z. TC 20-78 then moved northeastward into an area

dominated by strong westerlies aloft. The strong vertical shear that resulted caused the system to weaken to tropical storm intensity by 100800Z (Fig. 3-33). By the 11th, the strong vertical wind shear had reduced the cyclone to a shallow system noted on satellite imagery as spiral bands of low clouds and minimum to no deep convection - "an exposed low level circulation". Continued dissipation caused the satellite fixes to decrease in accuracy and conventional data, being sparse, aided little in pinpointing the center. As a result, the landfall of TC 20-78 on northwest India could only be approximated.

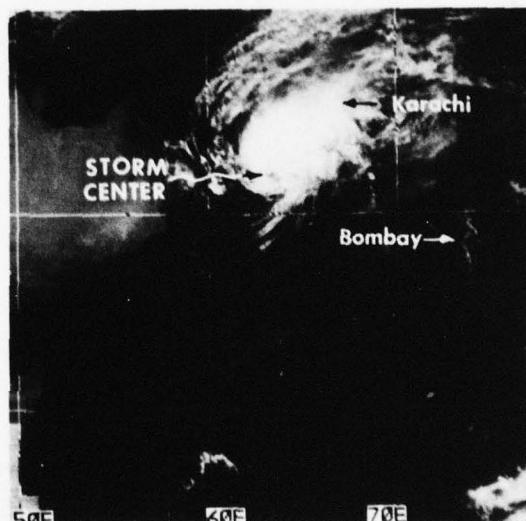
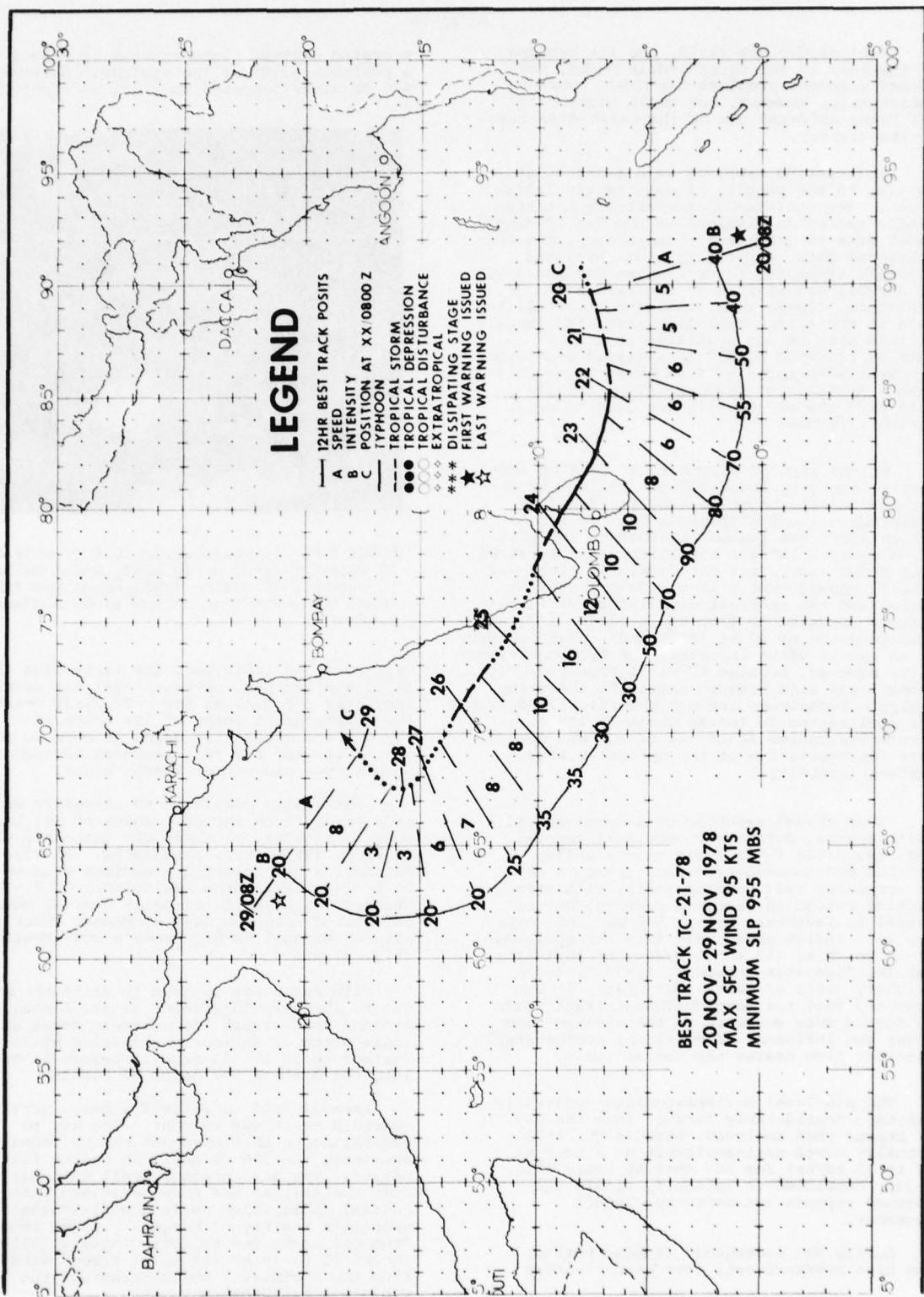


FIGURE 3-33. TC 20-78, 260 nm (482 km) southwest of Karachi on 10 November 1978 at 0659Z. The concentration of convective activity to one side of the cyclone and the cirrus showing unidirectional, upper-air flow are typical of cyclones in strong, vertical shear environments. A cyclonic circulation is becoming evident in the orientation of low clouds over the southern "exposed" portion of the cyclone. (DMSP imagery from AFQMC, Offutt AFB, NE)



Tropical Cyclone 21-78, the 4th cyclone of the year in the north Indian Ocean, presented forecast problems for JTWC. More importantly, however, the small country of Sri Lanka suffered one of the worst disasters in its history.

Forecasting problems were related, primarily, to the paucity of data in the Indian Ocean. Reconnaissance aircraft are not routinely tasked on missions in the Bay of Bengal. Radar data is practically unheard of, and conventional data, especially from ships and aircraft transiting the Arabian Sea and Bay of Bengal, are minimal to non-existent. Therefore, almost total reliance on satellite data is the rule. Real-time satellite imagery of this area is not available at JTWC. Data is received at AFGWC, analyzed and reports are sent some three to five hours after data time. Analysis of TIROS-N, APT satellite data from the USS LaSalle was used to supplement fix data.

On the 19th of November, an area of convective activity about 300 nm (556 km) northwest of Sumatra began to show increased organization, and a Tropical Cyclone Formation Alert was issued at 0705Z on the 20th of November. 200542Z satellite data, received from AFGWC just after the formation alert was issued, showed that a 15 nm (28 km) eye had formed and the tropical disturbance was immediately upgraded to Tropical Cyclone 21-78 with maximum winds of 40 kt (21 m/sec). The presence of an eye is often indicative of typhoon intensity; however, because TC 21-78 appeared quite compact and also because satellite intensity analysis techniques are not specifically designed for application to Indian Ocean cyclones, a more conservative 40 kt (21 m/sec) was deemed more representative of the cyclone's true surface intensity.

Even though synoptic data were generally quite sparse, sufficient upper-air reports were available to indicate that a well-defined mid-tropospheric high pressure cell was situated over central India, with strong ridging extending eastward over the Bay of Bengal to Southeast Asia. 500 mb winds over the east Indian coast were from the northeast at 25 to 30 kt (13 to 15 m/sec) at that time. Initial forecasts showed TC 21-78 tracking slightly north of west, then west. It was reasoned that the west-northwest track would be forced more westward as the cyclone came under the influence of mid-level northeasterly steering flow nearer the Indian coast.

The mid-level northeasterlies apparently extended considerably further into the Bay of Bengal than analyzed, because TC 21-78 actually moved west-southwest at 5 to 7 kt (9 to 13 km/hr) for the next 48 hours (Fig. 3-34), continued to intensify slowly and reached typhoon intensity by 220800Z November.

During the subsequent 48-hour period, the high pressure cell over central India

migrated eastward into the Bay of Bengal to a position north of the cyclone. Northerly 500 mb winds reported by stations along the

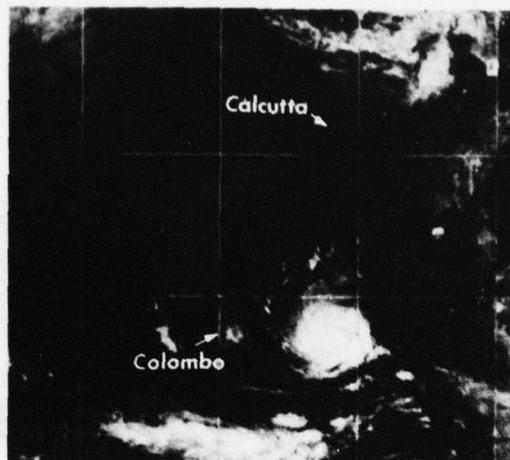


FIGURE 3-34. Infrared image of TC 21-78 at 50 kt (26 m/sec) intensity moving slowly toward Sri Lanka, 21 November 1978, 0542Z. (DMSP imagery from AFQMC, Offutt AFB, Nebraska as received by FWF Suitland, Maryland)

west coast of India were the first clue that still another high pressure cell had developed over the Arabian Sea. TC 21-78 reached the southernmost point of its track at 220800Z and thereafter began to move to the west-northwest toward a weakness between the Arabian Sea and Bay of Bengal highs.

The system continued to intensify and made landfall on the east coast of Sri Lanka, near Batticaloa, with maximum sustained winds of 95 kt (49 m/sec), at 231400Z. At 231200Z, Batticaloa had reported a surface wind of 85 kt (44 M/sec) from the north. TC 21-78 crossed Sri Lanka in slightly over 12 hours and exited into the Gulf of Mannar (near the city of Mannar) on Sri Lanka's west coast (Fig. 3-35).

With max winds reduced to 45 kt (23 m/sec) due to the terrain effects of Sri Lanka, the cyclone then struck the southern coast of India north of Tuticorin weakening still further to 30 kt (15 m/sec), before it moved into the Arabian Sea north of Cochin.

From 240000Z to 280000Z a basic north-westward track was evident. The key to understanding this movement can be found by examining the 500 mb analyses during that period. The high pressure cell that was over the Arabian Sea moved eastward into central India, then shifted east-southeastward into the Bay of Bengal. 500 mb reports from Sri Lanka and southern India at 251200Z showed 20 to 25 kt (10 to 13 m/sec) winds from the southeast, which supported the cyclone's northwest movement.

TC 21-78 did not reintensify significantly after its passage across Sri Lanka and India. (It was expected to reintensify once it was again over warm water, but re-intensification was slight and the system never again developed above tropical storm strength.) By 270600Z the cyclone's upper level center began to shear off from its surface center and satellite data revealed only low-level cloudiness signifying a low-level circulation. Warnings continued on the cyclone until 290800Z because it was felt that regeneration was still possible. By the 29th, satellite data indicated that TC 21-78 had weakened to the point that it was no longer a significant tropical circulation.

TC 21-78 was one of the most destructive storms of the year in either the Indian Ocean or West Pacific. Approximately one thousand people were killed and thousands of acres of crops were destroyed in Sri Lanka by the cyclone's winds, rain, and associated storm surge. In southern India only 10 people were killed; however, eighteen to twenty-five foot waves produced by the storm surge submerged 45 villages. Luckily, because of ample advance warning, the inhabitants were evacuated in time.

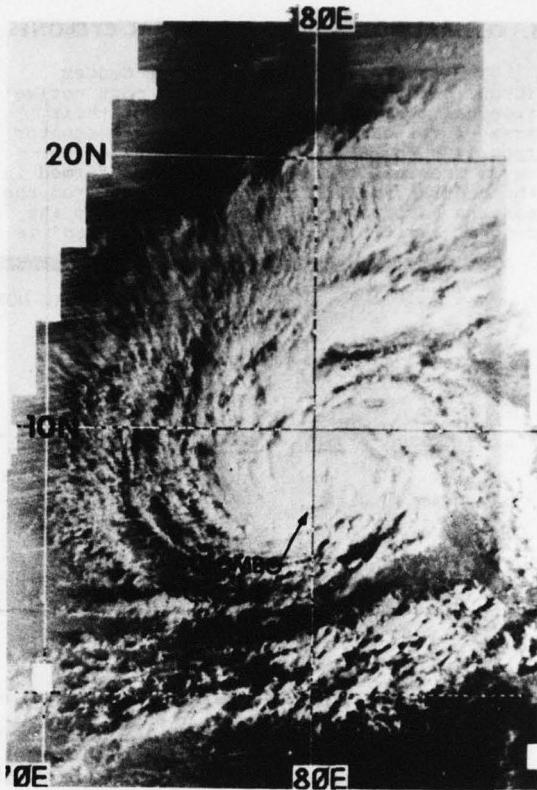


FIGURE 3-35. TC 21-78 located over north-central Sri-Lanka, 24 November 1978, 0118Z. (DMSP imagery from AFGWC, Offutt AFB, Nebraska)

3. CENTRAL NORTH PACIFIC TROPICAL CYCLONES

The Central Pacific Hurricane Center (CPHC) personnel saw 1978 as the most active tropical cyclone year on record for their area of responsibility (north of the equator from 140W to 180). Table 3-9 details the seven tropical cyclones that either formed in the central Pacific area or moved in from the eastern Pacific area. Table 3-10 shows the central Pacific tropical cyclone "season" is

well-defined and that 1978 was a record year for the number of tropical storms and hurricanes. This season not only set a record number of occurrences but also produced a cyclone with an exceptional length of travel and persistence of hurricane intensity (Fico), as well as one of the two most intense hurricanes on record in the central Pacific (Susan). Table 3-11 is a warning summary for the central North Pacific.

TABLE 3-9.
CENTRAL NORTH PACIFIC

1978 SIGNIFICANT TROPICAL CYCLONES

CYCLONE	TYPE	NAME	PRD OF WARNING*	CALENDAR DAYS OF WARNING	MAX SFC WIND	MIN OBS SLP	NO. OF WARNINGS	
							TOTAL	AS HU
07	HU	FICO	17 JUL - 28 JUL	12	100	955	43	39
10A**	TD	TD 10A	07 AUG - 09 AUG	3	30	-	11	-
12	HU	JOHN	23 AUG - 31 AUG	9	90	965	31	8
13	TS	KRISTY	26 AUG - 28 AUG	3	50	-	11	-
14	TS	LANE	20 AUG - 24 AUG	5	50	-	18	-
15	TS	MIRIAM	28 AUG - 01 SEP	5	55	-	18	-
30**	HU	SUSAN	18 OCT - 24 OCT	7	120	954	24	15
1978 TOTALS				35***			156	62

* Warning period while in central Pacific area.

** Cyclones that formed in the central Pacific area; all others began in the eastern Pacific area. Tropical Depression 10A was given the "A" suffix to clarify its individuality when Tropical Depression 10 formed in the eastern Pacific area.

*** Overlapping days included once in sum.

TABLE 3-10.

FREQUENCY OF CENTRAL PACIFIC STORMS BY MONTH AND YEAR
(NUMBERS IN PARENTHESES INDICATE STORMS REACHING HURRICANE INTENSITY)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1967	0	0	0	0	0	0	0	0	0	1	0	0	1
1968	0	0	0	0	0	0	0	2	0	0	0	0	2
1969	0	0	0	0	0	0	0	0	0	0	0	0	0
1970	0	0	0	0	0	0	0	1	0	0	0	0	1(1)
1971	0	0	0	0	0	0	1(1)	1	0	0	0	0	2(1)
1972	0	0	0	0	0	0	0	3(1)	1	0	0	0	4(1)
1973	0	0	0	0	0	0	1(1)	0	0	0	0	0	1(1)
1974	0	0	0	0	0	0	0	2(1)	0	0	0	0	2(1)
1975	0	0	0	0	0	0	0	0	0	0	0	0	0
1976	0	0	0	0	0	0	0	0	1(1)	0	0	0	1(1)
1977	0	0	0	0	0	0	0	0	0	0	0	0	0
1978	0	0	0	0	0	0	1(1)	4(1)	0	1(1)	0	0	6(3)
AVERAGE (1967-78)	0	0	0	0	0	0	.3(.3)	1.1(.3)	.2(.1)	.2(.1)	0	0	1.8(.8)

TABLE 3-11.

WARNING SUMMARY

	<u>CENTRAL NORTH PACIFIC</u>	
	<u>1978</u>	<u>AVERAGE 1971-1977</u>
TOTAL NUMBER OF WARNINGS	156	30
NUMBER OF WARNING DAYS	35	9
NUMBER OF WARNING DAYS WITH 2 OR MORE CYCLONES	8	1
NUMBER OF WARNING DAYS WITH 3 OR MORE CYCLONES	1	0
TROPICAL DEPRESSIONS	1	1
TROPICAL STORMS	3	1
HURRICANES	3	1
TOTAL TROPICAL CYCLONES	7	3

JTWC

Hurricane Fico, 9-28 July, was the longest lived and most intense eastern Pacific cyclone of historical record. Fico reached hurricane strength at 111 degrees west longitude and maintained winds in excess of 65 kt (33 m/sec) for 18 days while traveling 4,200 miles (6758 km) westward to 176W, near Midway Island. Although Fico's maximum intensity of 115 kt (59 m/sec) occurred just prior to entering the central Pacific (140W), Hurricane Susan, in October attained winds of 120 kt (62 m/sec) while 360 miles (579 km) southeast of Hilo, Hawaii, making her the strongest tropical cyclone ever observed near the Hawaiian Islands.

Hurricane John and Tropical Storm Kristy were named at the same time, 0000 GMT, 19 August 1978, while in the eastern Pacific. At this time Tropical Storm Lane was centered further west than the others, thereby explaining why it entered the central Pacific out of alphabetical order.

GOES-3 imagery (Fig. 3-36) depicts three cyclones; John, Kristy, and Miriam. At the time of this satellite photograph, John was at tropical storm intensity and subsequently

weakened further and meandered west-southwestward to 170W.

With the demise of Tropical Storm Miriam, the Honolulu staff felt that the central Pacific season was likely over. But on the 18th of October, a suspicious area southeast of Hawaii rapidly developed into a full-fledged tropical storm. This was the capricious Susan, the last storm of the season. Susan attained tropical storm intensity at precisely the same location where the first eastern Pacific storm of the season, to threaten the central Pacific area, Bud, dissipated; near 10N-145W. Continuing to intensify, by the 21st, Susan became one of the two most intense hurricanes on record in the central Pacific. Maximum sustained winds of 120 kt (62 m/sec) equaled those attained by Celeste in August of 1972. Figure 3-37 depicts Susan at 220016Z during peak intensity while a very real threat to the Hawaiian Islands. After reaching a point 220 nm (408 km) southeast of the Big Island, however, Susan turned sharply to the southwest, very rapidly dissipated, and luckily the Hawaiian Islands were once again spared.

An individual summary of Hurricane Fico follows.

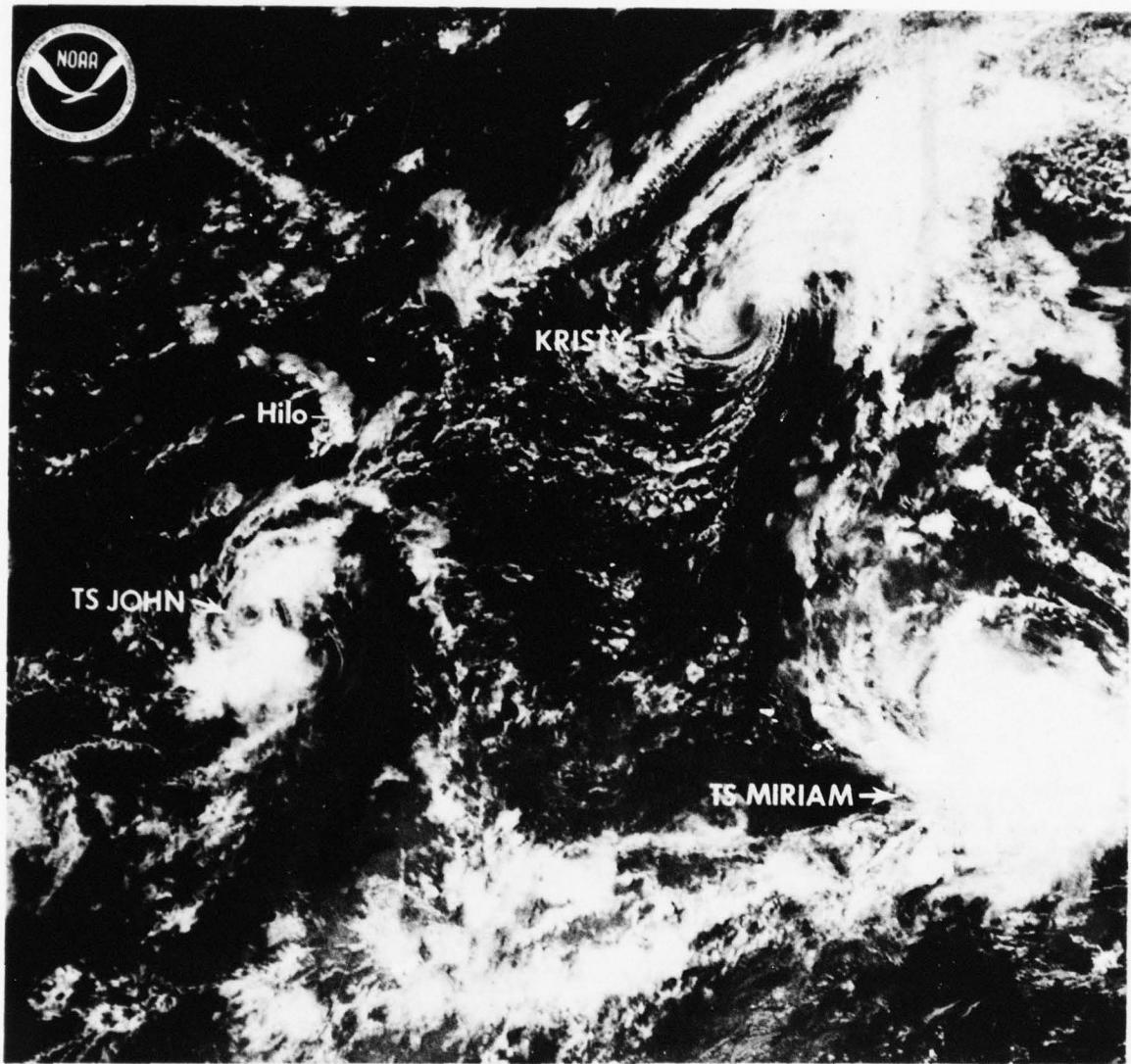


FIGURE 3-36. Tropical Storm John (downgraded from Hurricane John) is centered 240 nm (417 km) south-southwest of South Point, Hawaii. Kristy, downgraded to a tropical disturbance, 600 nm (1120 km) east-northeast of Hilo, Hawaii, and Tropical Storm Miriam 925 nm (1714 km) southeast of Hilo, Hawaii, 27 August 1978, 2315Z. (GOES imagery from SFSS, Honolulu, Hawaii)

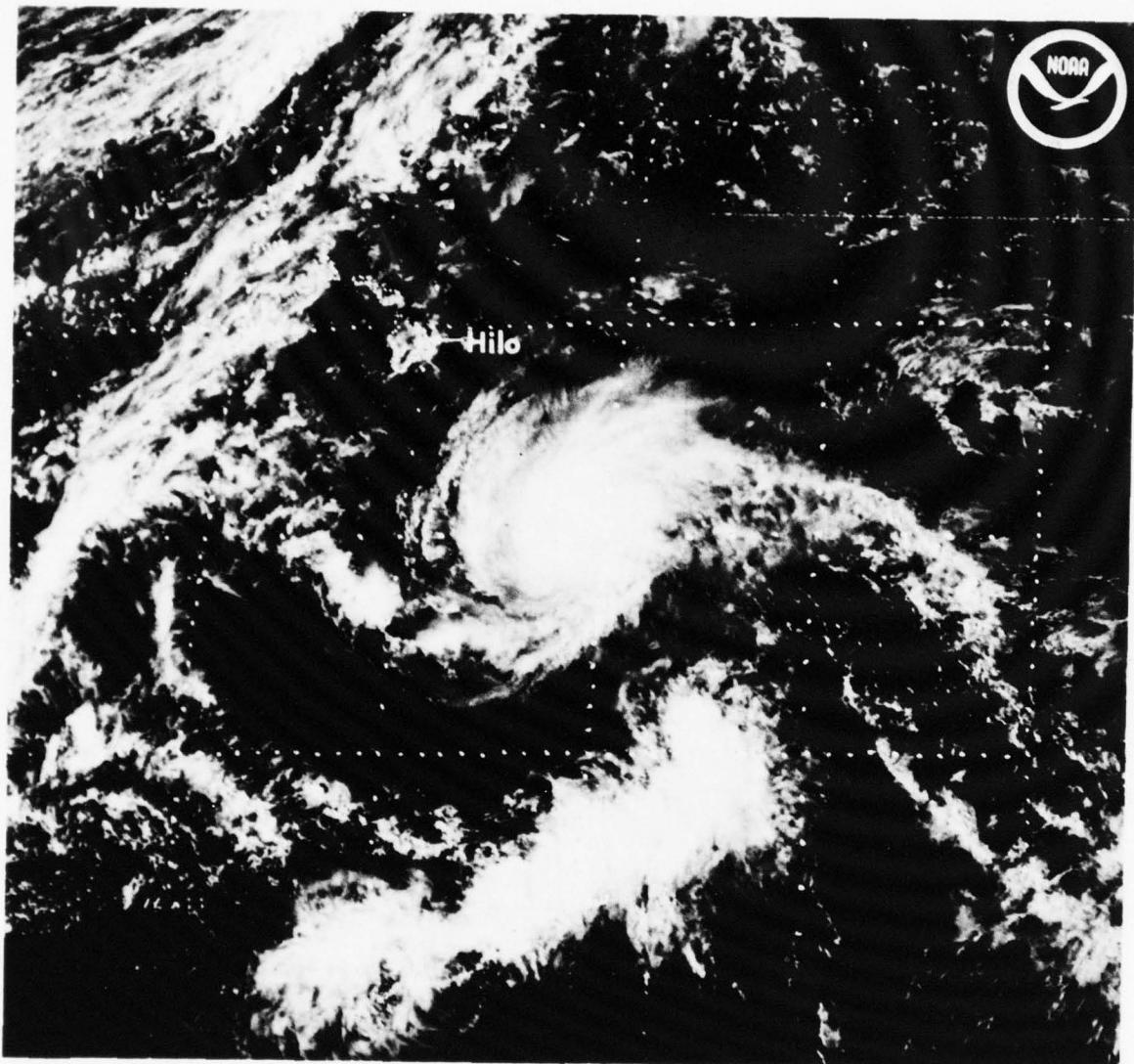
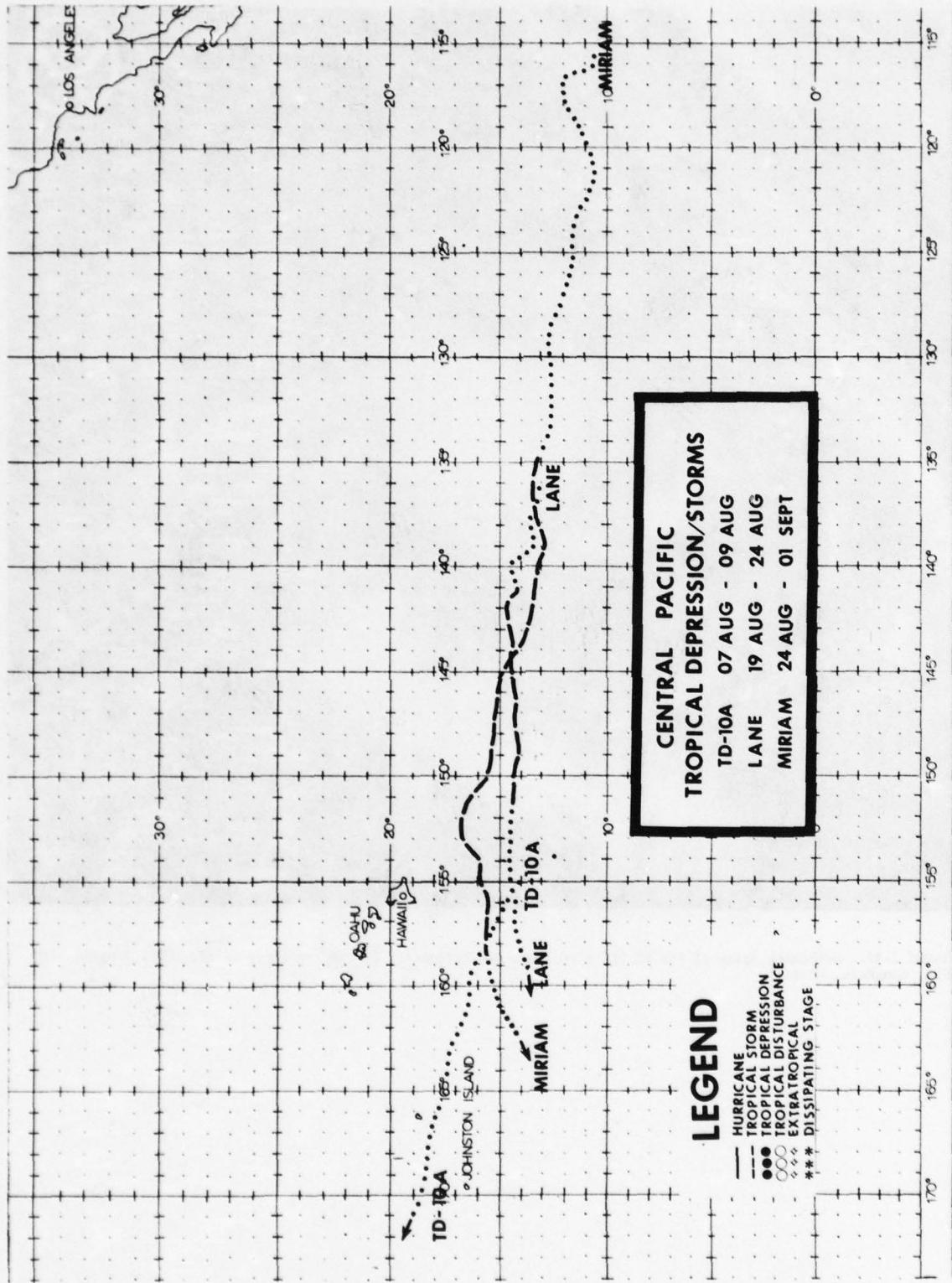
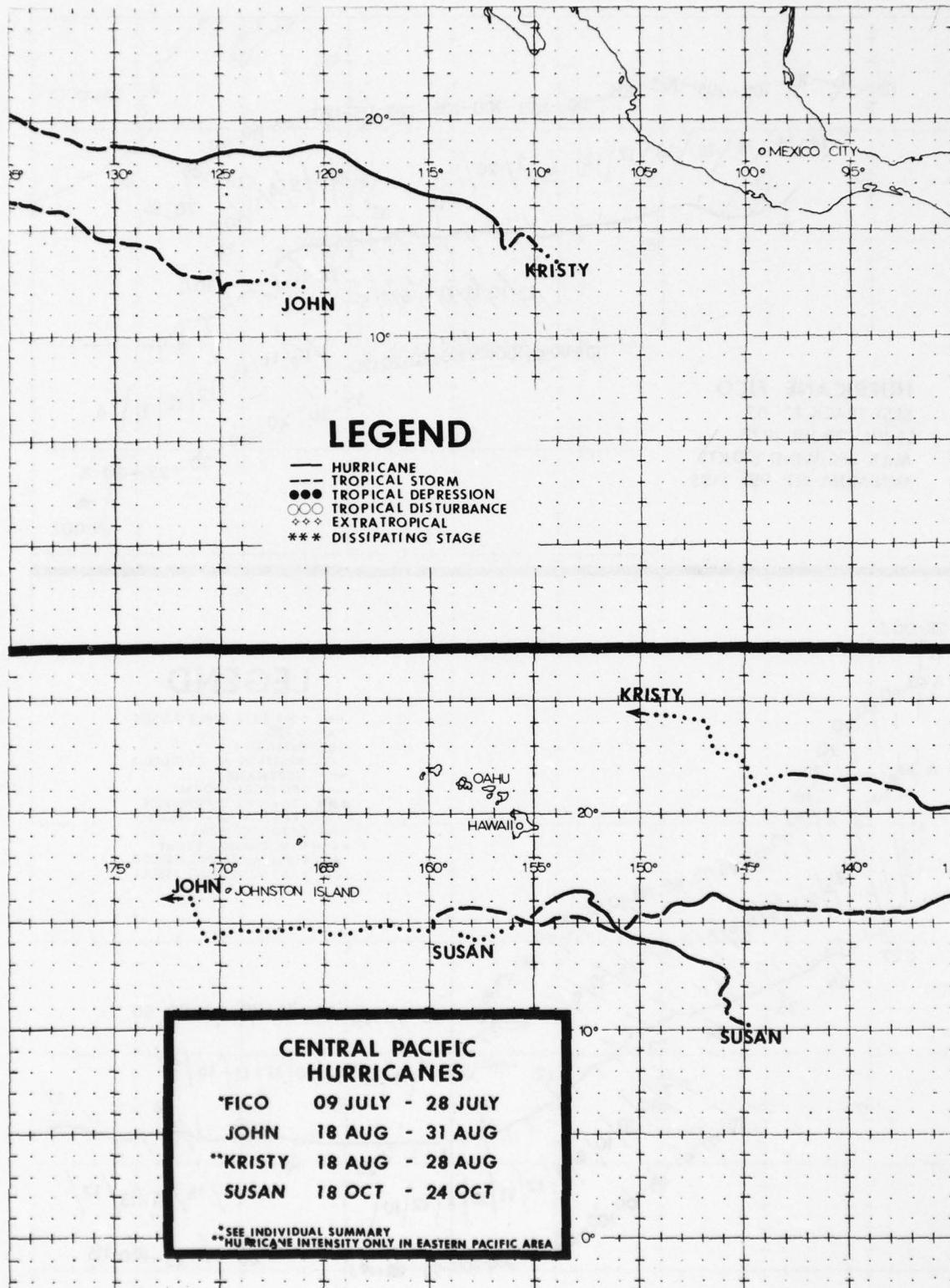
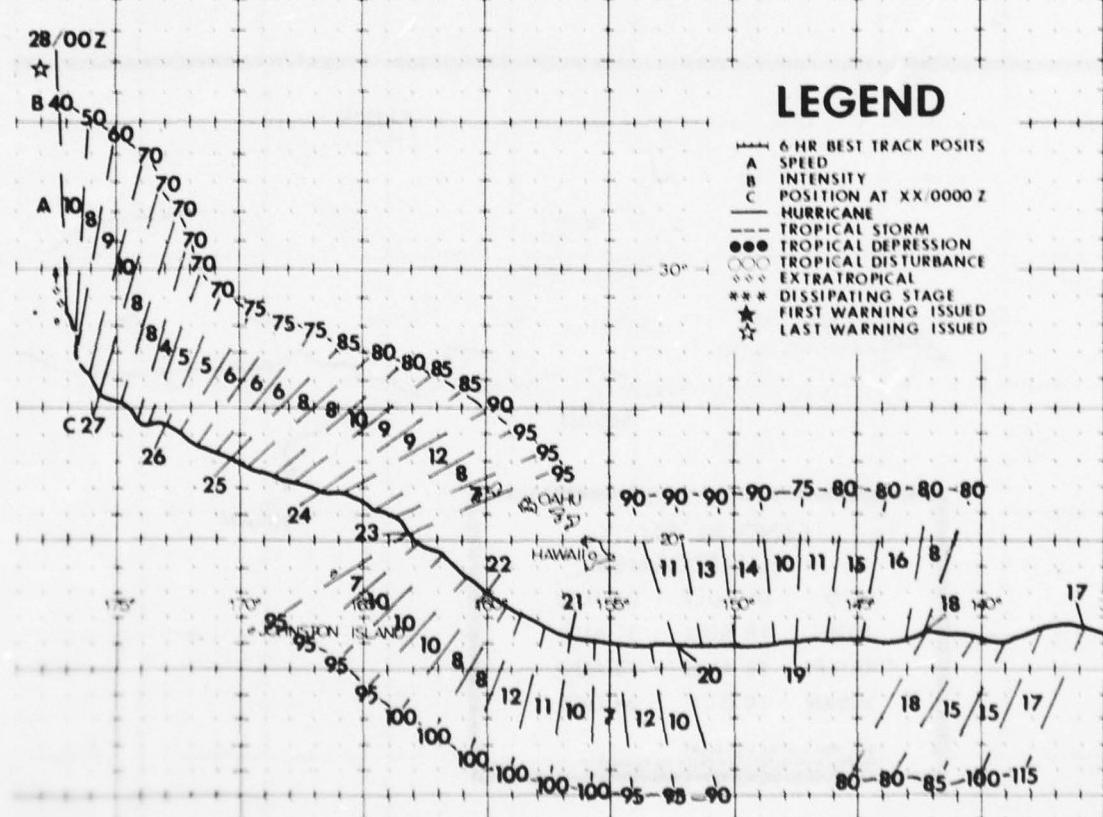
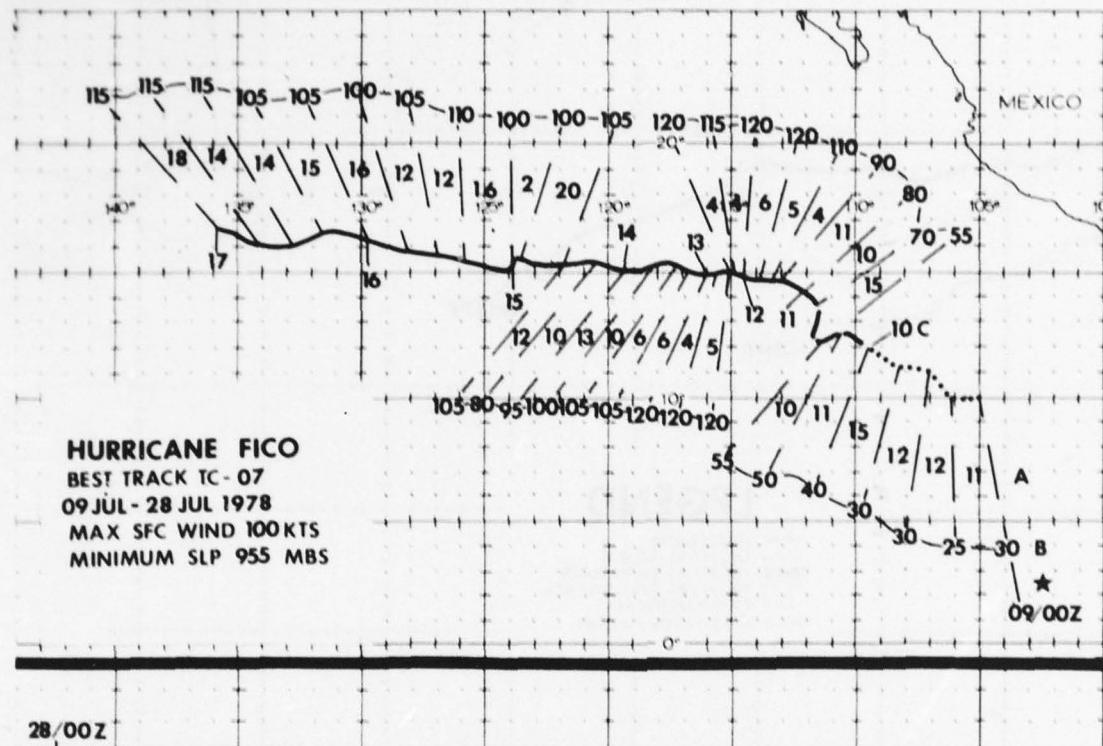


FIGURE 3-37. Hurricane Susan at 120 kt (62 m/sec) maximum intensity, 22 October 1978, 0016Z. [GOES imagery from SFSS, Honolulu, Hawaii]







HURRICANE PICO

Hurricane Pico entered the Central Pacific at 160°-140°W on 17 July 1978 with maximum sustained winds near 80 kt (41 m/sec). Pico attained a maximum intensity of 115 kt (59 m/sec) while still in the Eastern Pacific east of 140°W. Pico proceeded along the 16th parallel to a point due south of South Point, Hawaii, U. S. Air Force aircraft and satellite reconnaissance and NESS satellite imagery showed a steady increase in Pico's intensity during its travel from 140°W to its position south of South Point.

Surf due to open ocean swell from Pico began to rise on the 18th, with some beach road flooding along the southeast coast of the Big Island when Pico was 500 nm (927 km) to the southeast. Higher than normal surf at this time was also enhanced by southerly swell from a southern hemisphere storm. By the morning of the 19th, Civil Defense officials reported 30 foot (9.1 m) surf breaking well offshore with smaller 15 to 20 foot (4.6 to 6.1 m) short period surf doing considerable damage to beach-front homes and roads on the Big Island. Eight to 12 foot (2.4 to 3.7 m) surf was observed on Eastern Maui by noon of the 19th, with water over roads but no damage

reported. Very short period surf of similar heights reached southern Oahu and southern Kauai on the following day.

On July 20 (Fig. 3-38), the hurricane was 175 nm (324 km) south-southeast of South Point with maximum sustained winds of 100 kt (51 m/sec). Late on the 20th, Pico began moving northwestward and maintained 100 kt (51 m/sec) winds until 190 nm (325 km) due south of Kauai. A strong trade wind gradient, increased by the proximity of Pico, caused strong gusty winds over all the Hawaiian Islands with numerous reports of 50 kt (26 m/sec) or more, accompanied by falling trees and power line outages.

Pico maintained hurricane intensity for 17 days and was tracked by the Honolulu and San Francisco National Weather Service forecast offices (with much support from respective NESS units) for approximately 5000 nm (9266 km). The effects of Pico were felt during and after extratropical transition; remnants of Pico, enmeshed in a strong cold frontal system, inflicted heavy rain and up to 40 kt (21 m/sec) winds on ships southeast of Cold Bay in the Aleutians on July 31.

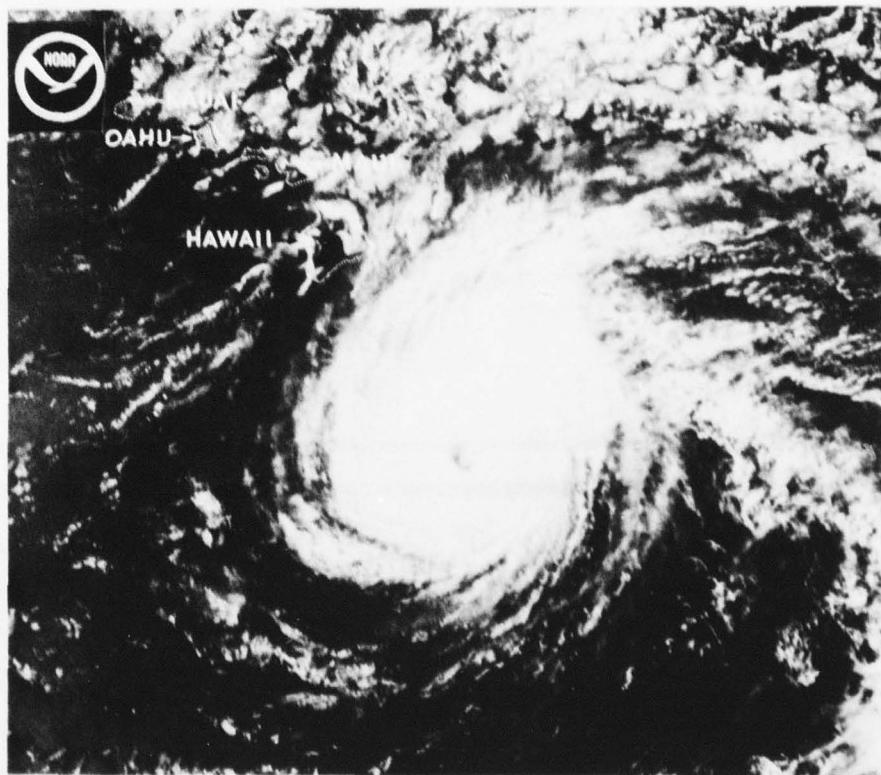


FIGURE 3-38. Hurricane Pico threatening Hawaii, 20 July 1978, 0115Z.
(GOES imagery from SIPS, Honolulu, HI)

CHAPTER IV - SUMMARY OF FORECAST VERIFICATION

1. ANNUAL FORECAST VERIFICATION

a. Western North Pacific Area

Forecast positions at warning times and 24-, 48- and 72-hour valid times were verified against corresponding best tracks and vector errors and right angle errors were calculated (Table 4-1). Annual, mean errors are listed in Table 4-2 for comparison. Frequency distributions of the vector errors of

the 24-, 48- and 72-hour forecasts on all 1978 cyclones are shown in Figure 4-1 and annual, mean vector errors are graphed in Figure 4-2. Previous reports have shown a graph of the annual, mean vector errors for typhoons when best track intensity at verifying time was 35 kt or greater. This, subset, error graph is shown in Figure 4-3. Mean vector errors shown in Figure 4-3 are lower than those depicted in Figure 4-2; nonetheless, similar trends are evident from year to year.

TABLE 4-1. FORECAST ERROR SUMMARY FOR THE 1978 WESTERN NORTH PACIFIC SIGNIFICANT TROPICAL CYCLONES.

CYCLONE	WARNING			24 HOUR			48 HOUR			72 HOUR		
	POSIT ERROR	RT ANGLE ERROR	WRNGS	FCST ERROR	RT ANGLE ERROR	WRNGS	FCST ERROR	RT ANGLE ERROR	WRNGS	FCST ERROR	RT ANGLE ERROR	WRNGS
1. TS NADINE	23	15	20	185	109	16	568	381	12	980	708	8
2. TY OLIVE	14	10	36	100	62	32	224	129	28	328	215	20
3. TS POLLY	16	10	16	93	50	12	139	93	8	208	97	2
4. TS ROSE	17	21	7	235	142	3						
5. TS SHIRLEY	24	15	3									
6. TY TRIX	21	17	38	174	122	35	425	298	30	657	531	24
7. TY VIRGINIA	20	12	43	112	63	39	231	127	35	399	283	31
8. TY WENDY	21	12	40	112	75	36	235	188	30	328	188	30
9. TS AGNES	10	7	22	97	59	19	243	191	12	410	309	3
10. TS BONNIE	31	20	8	121	36	4						
11. TY CARMEN	19	10	36	124	56	30	250	125	19	429	266	12
12. TS DELLA	29	20	10	116	73	6	217	131	2			
13. TD-14	25	23	6	169	127	2						
14. TY ELAINE	22	15	20	132	77	16	278	157	12	263	174	8
15. TY FAYE	15	12	44	158	113	40	360	285	36	514	396	29
16. TS GLORIA	21	13	11	138	79	7	496	331	3			
17. TS HESTER	34	17	9	198	28	5	300	52	1			
18. TY IRMA	14	12	15	92	44	12	134	31	8	154	67	4
19. TY JUDY	19	12	18	127	51	14	242	131	10	346	185	6
20. TS KIT	32	16	21	165	84	18	231	134	10	295	210	7
21. TY LOLA	13	9	34	54	40	30	112	79	26	134	88	17
22. TY MAMIE	25	14	18	182	68	14	386	143	10	722	327	6
23. TS NINA	19	16	35	120	94	31	240	212	27	382	340	22
24. TY ORA	19	14	21	124	99	17	314	239	11	460	391	5
25. TD-26	40	10	7	218	22	4						
26. TD-27	38	30	6	175	168	3						
27. TY PHYLLIS	22	13	28	132	86	24	263	198	20	436	377	15
28. ST RITA	15	10	51	107	60	47	214	114	43	301	157	39
29. TS TESS	29	21	20	108	53	16	194	127	12	367	237	8
30. TD-32	50	33	12	133	108	9	401	349	5	973	871	1
31. TY VIOLA	19	10	29	96	51	25	269	172	21	434	338	17
32. TS WINNIE	34	16	12	238	81	8	614	274	4			
ALL FORECASTS	21	13	696	127	75	574	271	179	435	410	297	304

TABLE 4-2. ANNUAL MEAN FORECAST ERRORS FOR THE WESTERN NORTH PACIFIC.

YEAR	24-HR		48-HR		72-HR	
	VECTOR	RIGHT ANGLE	VECTOR	RIGHT ANGLE	VECTOR	RIGHT ANGLE
1970	104	-	190	-	279	-
1971	111	64	212	118	317	177
1972	117	72	245	146	381	210
1973	108	74	197	134	253	162
1974	120	78	226	157	348	245
1975	138	84	288	181	450	290
1976	117	71	230	132	338	202
1977	148	83	283	157	407	228
1978	127	75	271	179	410	297

JTWC

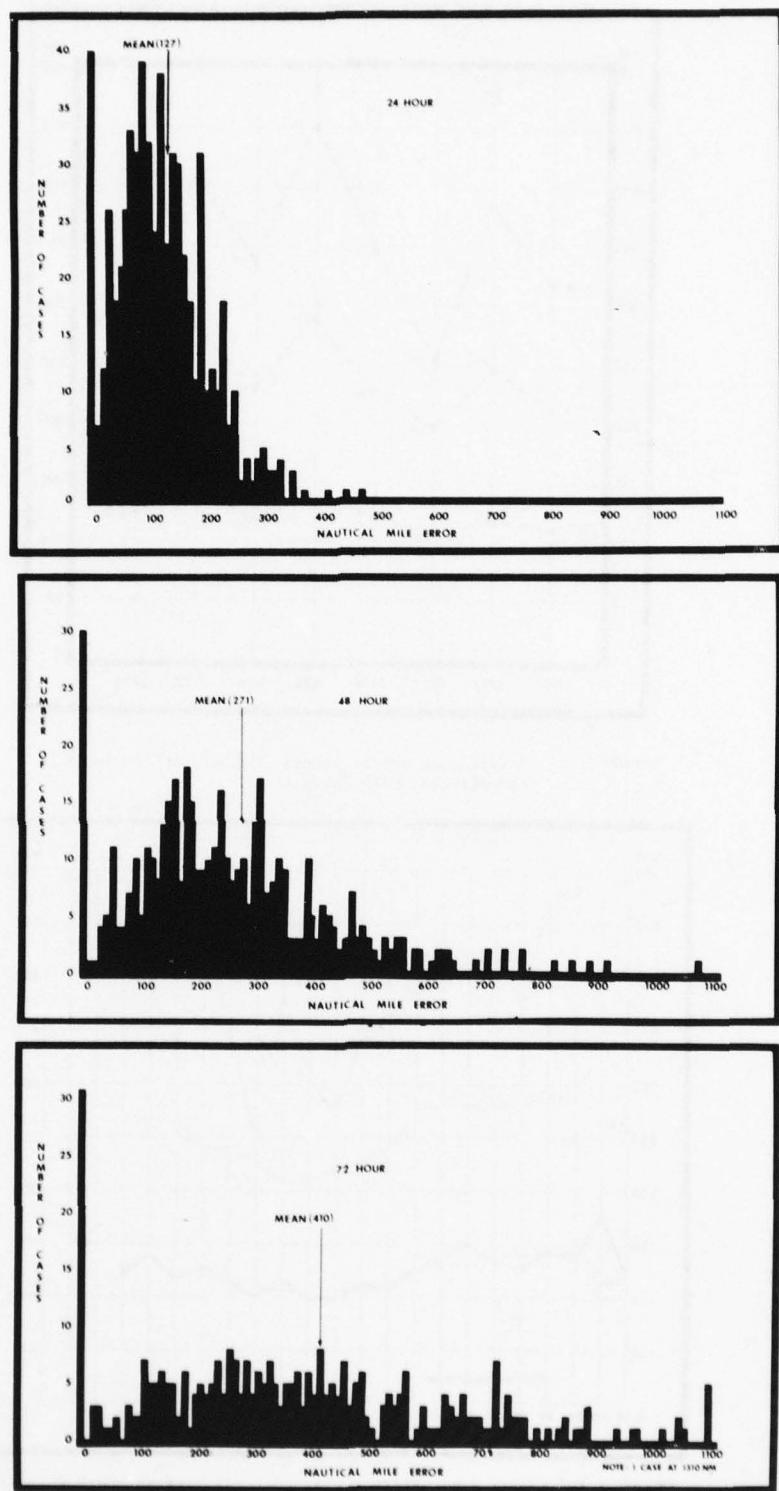


FIGURE 4-1. Frequency distribution of 1978 24-, 48-, and 72-hour forecast vector errors for all significant tropical cyclones in the western North Pacific.

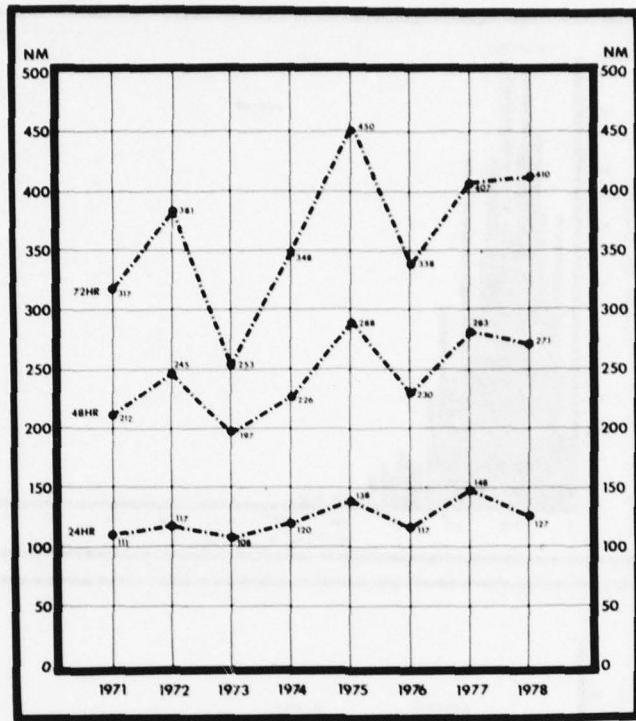


FIGURE 4-2. Annual mean vector errors (nm) for all cyclones in the western North Pacific.

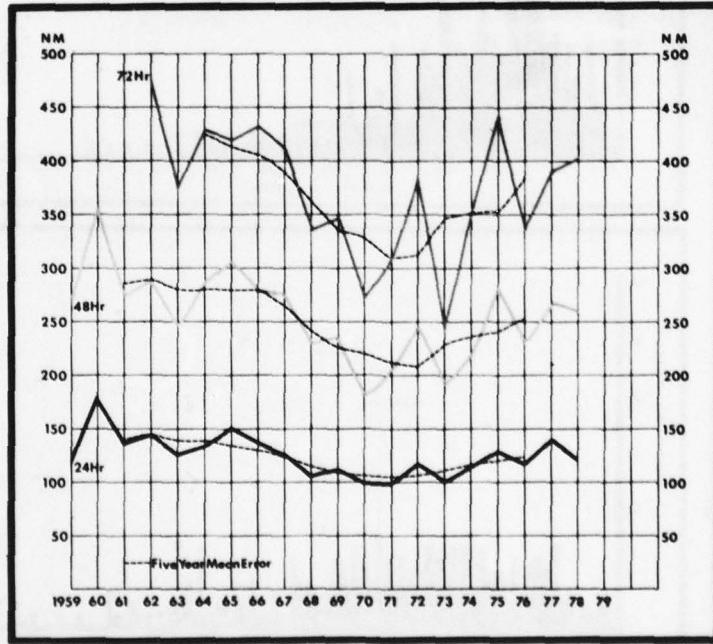


FIGURE 4-3. Annual mean vector errors (nm) for western North Pacific typhoons only when best track intensities were greater than 34 knots at time of verification.

Intensity verification statistics for all significant, tropical cyclones in the western North Pacific area are depicted in Figures 4-4 and 4-5. The average absolute magnitude of the intensity error as well as the intensity bias (algebraic average) are graphically depicted. An analysis of the errors indicates that JTWC intensity forecasts often lag the true intensity; in an intensifying situation, JTWC underforecasts, and in a weakening situation, JTWC overforecasts thereby causing large average magnitude error but small average bias. Objective intensity forecasting aids verification is also depicted in Figures 4-4 and 4-5. (An explanation of the objective forecasting aids can be found in this chapter, Section 2 - Comparison Of Objective Techniques.) It is interesting to note that the objective intensity forecasting aids consistently overforecast by approximately 10 knots.

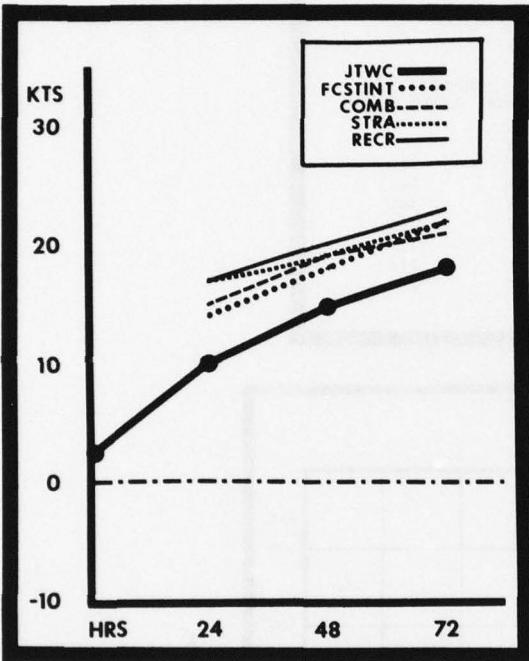


FIGURE 4-4. Comparison of average intensity errors (magnitude) for all cyclones in the western North Pacific.

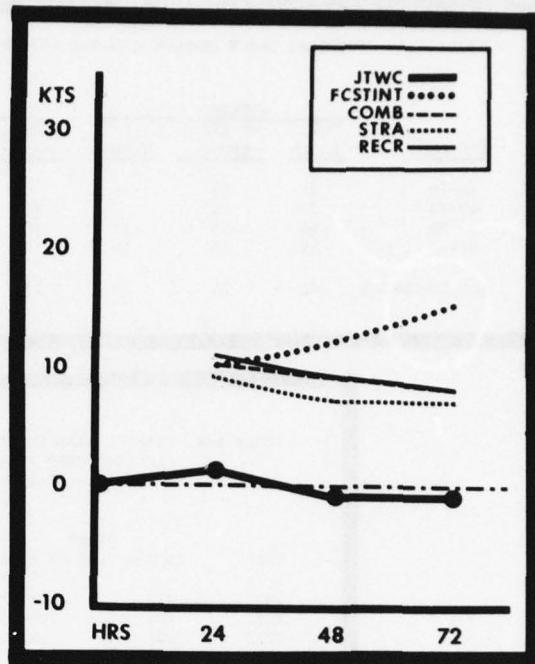


FIGURE 4-5. Comparison of average intensity errors (biases) for all cyclones in the western North Pacific.

b. North Indian Ocean Area

Forecast positions at warning times and 24- and 48-hour valid times were verified by the same methods used for the western North Pacific area verification. Table 4-3 is the forecast error summary for the four significant tropical cyclones in the North Indian Ocean area. Table 4-4 contains the annual average of forecast errors back through 1971. Vector errors are plotted in Figure 4-6.

Forecast intensities were not verified.

TABLE 4-3. FORECAST ERROR SUMMARY FOR THE 1978 NORTH INDIAN OCEAN SIGNIFICANT TROPICAL CYCLONES.

CYCLONE	WARNING			24 HOUR			48 HOUR		
	POSIT ERROR	RT ANGLE ERROR	# WRNGS	FCST ERROR	RT ANGLE ERROR	# WRNGS	FCST ERROR	RT ANGLE ERROR	# WRNGS
18-78	55	51	4	88	41	3	78	45	1
19-78	35	25	7	203	183	3			
20-78	54	25	12	165	101	9	205	102	5
21-78	31	18	16	104	62	13	213	147	11
ALL FORECASTS	41	25	39	133	86	28	202	128	17

JTWC

TABLE 4-4. ANNUAL MEAN FORECAST ERRORS FOR THE NORTH INDIAN OCEAN (THE ARABIAN SEA WAS NOT INCLUDED PRIOR TO 1975).

YEAR	24-HR		48-HR	
	VECTOR	RIGHT ANGLE	VECTOR	RIGHT ANGLE
1971	232	-	410	-
1972	224	101	292	112
1973	182	99	299	160
1974	137	81	238	146
1975	145	99	228	144
1976	138	108	204	159
1977	122	94	292	214
1978	133	86	202	128

JTWC

INDIAN OCEAN FORECAST ERRORS

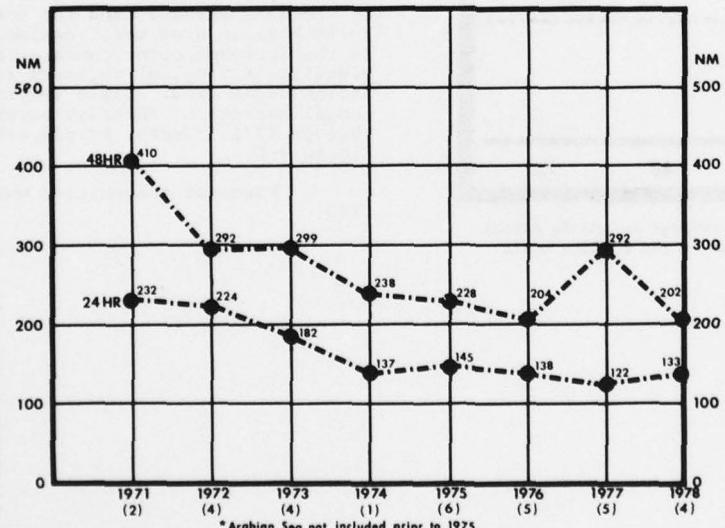


FIGURE 4-6. Annual mean vector errors (nm) for all cyclones in the North Indian Ocean.

2. COMPARISON OF OBJECTIVE TECHNIQUES

a. General

Objective techniques employed by JTWC are divided into four main categories: (1) climatological and analog techniques; (2) extrapolation; (3) steering techniques; and, (4) a dynamical model. The analog technique provides three movement forecasts, one for straight moving cyclones, one for recurving cyclones and one combining the tracks of straight, recurving and cyclones that do not meet the criteria of straight or recurring analogs. All techniques were executed using the operational data available at the warning time.

b. Description of Objective Techniques

(1) TYFN75 - Analog program which scans history tapes for cyclones similar (within a specified acceptance envelope) to the current cyclone. Three 24-, 48-, and 72-hour position and intensity forecasts are provided.

(2) MOHATT 700/500 - Steering program which advects a point vortex on a pre-selected analysis and smoothed prognostic fields at designated levels in 6-hour time steps through 72 hours. Utilizing the previous 12-hour history position, MOHATT computes the 12-hour forecast error and applies a bias correction to the forecast position.

(3) TCM - Tropical Cyclone Forecast Model is a coarse mesh (220 km) PE Model, with the digitized storm warning position bogused at the 850 mb level of the FNWC Global Band Analysis utilizing wind and temperature fields. Boundary conditions permit no mass transfer across north or south walls, and east/west boundaries are cyclical.

(4) FCSTINT - Intensity forecast program which utilizes statistical regression equations to provide 24-, 48-, and 72-hour forecast intensities.

(5) 12-HR EXTRAPOLATION - A track through current warning position and 12-hour old preliminary best track position is linearly extrapolated to 24 and 48 hours.

(6) HPAC - Mean 24 and 48 hour forecast positions are derived by averaging the 24 and 48 hour positions from the 12-HR EXTRAPOLATION track and a track based on climatology.

(7) INJAH74 - Analog program for North Indian Ocean. Similar to TYFN75, except tracks are not segregated.

(8) TYAN - An updated analog program which combines TYFN75, INJAH74, and other analog programs for the remaining northern/southern Pacific Ocean areas and the South Indian Ocean.

(9) CYCLOPS - An updated version of MOHATT program which has the capability to select steering forecasts at the 1000, 850, 700, 500, 400, 300 and 200 mb levels.

c. Testing and Results

A comparison of selected techniques is included in Table 4-5 for all western Pacific cyclones and Table 4-6 for Indian Ocean cyclones. In Tables 4-5 and 4-6 "X-AXIS" refers to techniques listed horizontally across the top, while "Y-AXIS" refers to techniques listed vertically. The example in Table 4-5 compares COMB to MH70. In the 407 cases available for comparison the average 24-hour vector error for COMB was 139 nm, while that for MH70 was 140 nm. The difference of 1 nm is shown in the lower right. (Differences are not always exact due to computational round off.)

TABLE 4-5.

24-HOUR										
JTWC	STRA	RECR	COMB	MH70	MH50	TCMM	TCND	XTRP	HPAC	
574 127 127 0	462 120 147 27	465 147 147 0	511 141	407 139 140 14	442 140 140 0	375 135 145 10	375 145 145 0	NUMBER OF CASES	X-AXIS TECHNIQUE ERROR	
509 126 140 14	442 148 138 -10	511 141 141 0	519 137 137 0	407 139 140 14	442 140 140 0	375 135 145 10	375 145 145 0	Y-AXIS TECHNIQUE ERROR	ERROR DIFFERENCE Y-X	
516 125 136 11	445 147 134 -12	496 140 137 -2	519 137 137 0	407 139 140 14	442 140 140 0	375 135 145 10	375 145 145 0			
440 126 140 14	373 150 134 -15	402 143 141 -1	407 139 140 14	442 140 140 0	375 135 145 10	375 145 145 0	375 135 145 10			
374 125 145 20	318 148 140 -7	341 143 147 3	347 139 145 7	375 135 145 10	375 145 145 0	375 135 145 10	375 145 145 0			
128 122 175 53	111 150 156 6	120 135 172 37	116 137 175 38	99 138 180 42	97 147 182 35	128 175 175 0	128 175 175 0			
117 121 237 116	102 149 213 64	110 135 235 100	111 141 236 96	92 136 251 115	89 142 253 111	82 172 251 79	117 237 237 0			
564 127 137 11	458 147 128 -17	506 440 137 -2	513 137 137 0	435 140 137 -2	371 146 134 -11	126 173 129 -43	117 237 130 -106	567 137 137 0		
538 127 137 9	444 147 128 -18	486 141 136 -4	492 137 136 -1	423 139 135 -3	360 143 133 -9	123 170 127 -42	115 231 129 -100	541 138 137 0	541 137 137 0	

48-HOUR

JTWC	STRA	RECR	COMB	MH70	MH50	TCMM	TCND	XTRP	HPAC
435 271 271 0	368 262 301 39	388 304 304 0							
389 264 262 -1	368 310 267 -42	405 268 268 0							
390 263 251 -11	369 303 252 -50	394 265 256 -8	413 254 254 0						
325 270 289 18	307 316 284 -31	314 281 293 12	316 264 291 27	343 293 293 0					
278 269 288 19	264 113 290 -23	267 283 293 10	271 265 289 24	294 290 288 -1	294 286 288 0				
89 262 284 22	85 295 275 -19	86 258 287 31	81 243 284 41	71 269 302 32	69 270 304 35	92 284 284 0			
84 266 362 96	80 308 354 47	83 260 364 104	82 251 362 111	69 260 385 125	67 263 385 122	56 298 370 72	87 363 363 0		
425 270 291 21	374 302 289 -12	393 264 293 29	397 253 291 39	329 291 301 10	285 288 297 8	88 281 286 5	85 362 303 -59	438 294 294 0	
394 276 262 -13	354 305 247 -57	367 266 258 -6	368 257 256 0	314 290 260 -29	271 287 257 -29	86 283 245 -37	82 364 257 -106	406 298 263 -34	407 263 263 0

72-HOUR

JTWC	STRA	RECR	COMB	MH70	MH50	TCMM	TCND
304 410 410 0	258 391 412 21	306 422 422 0					
275 403 341 -61	288 429 350 -79	320 359 359 0					
276 400 325 -74	292 421 325 -95	313 358 336 -21	324 334 334 0				
211 412 446 34	229 431 442 11	458 373 233 85	235 342 454 112	255 449 449 0			
183 407 438 32	200 433 430 -1	203 378 433 55	204 341 427 86	220 434 429 -4	221 430 430 0		
60 414 452 38	62 402 447 45	63 356 466 110	60 339 452 113	51 414 495 81	49 430 490 59	68 458 458 0	
0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0

24-HOUR

	JTWC	INJA	MH7Ø	MH5Ø	XTRP	HPAC
JTWC	28 133 133 0					
INJA	20 136 117 -18	23 132 132 0				
MH7Ø	9 128 222 95	8 122 245 123	10 219 219 0			
MH5Ø	7 131 251 120	6 117 282 165	7 236 251 15	7 251 251 0		
XTRP	25 119 137 18	22 128 159 31	9 203 133 -69	6 231 109 -123	28 151 151 0	
HPAC	22 117 114 -1	18 119 124 5	6 246 134 -111	3 331 105 -225	24 144 123 -20	24 123 123 0

48-HOUR

	JTWC	INJA	MH7Ø	MH5Ø	XTRP	HPAC
JTWC	17 202 202 0					
INJA	11 194 202 8	14 231 231 0				
MH7Ø	3 99 149 49	3 270 263 -6	4 224 224 0			
MH5Ø	3 168 246 78	3 310 270 -39	3 279 186 -93	4 243 243 0		
XTRP	16 200 244 44	13 214 298 85	3 149 304 155	3 246 330 84	19 286 286 0	
HPAC	15 205 191 -13	12 211 225 13	2 82 88 6	2 287 201 -85	18 276 221 -54	18 221 221 0

JTWC - OFFICIAL JTWC FORECAST
 INJA - ANALOG
 MH7Ø - MOHATT 700-MB PROG
 MH5Ø - MOHATT 500-MB PROG
 XTRP - 12-HOUR EXTRAPOLATION
 HPAC - MEAN OF XTRP AND CLIMATOLOGY

TABLE 4-6.

CHAPTER V - RESEARCH & DEVELOPMENT SUMMARY

1. GENERAL

Part of the mission of the Joint Typhoon Warning Center is to conduct applied tropical cyclone research as time and resources permit; the objective of this research being the improvement of operational forecasts. This year, due to the installation of the Naval Environmental Display Station (NEDS), the JTWC staff devoted considerable time and effort in converting and updating operational programs and streamlining operational procedures for compatibility with the NEDS. The following abstracts summarize the year's research and development projects completed or still in progress.

2. TROPICAL CYCLONE MINIMUM SEA LEVEL PRESSURE - MAXIMUM SUSTAINED WIND RELATIONSHIP

(Shewchuk, J. D and Lubeck, O. M., FLEWEACEN/JTWC)

The pressure-wind relationship developed by Atkinson and Holliday, Tropical Cyclone Minimum Sea Level Pressure - Maximum Sustained Wind Relationship for Western North Pacific (FLEWEACEN TECH NOTE: JTWC 75-1), is a primary tropical cyclone intensity determination tool used for JTWC operations. The current research is an attempt to update and refine the Atkinson and Holliday study using the original data plus new data from 1975 to present. The current regression equation will be re-evaluated using new cases as an independent data set.

3. EQUIVALENT POTENTIAL TEMPERATURE/MINIMUM SEA LEVEL PRESSURE RELATIONSHIPS TO FORECASTING TROPICAL CYCLONE INTENSIFICATION

(Hassebrock, A. W. and Dunnavan, G., FLEWEACEN/JTWC)

The relationship between equivalent potential temperature at 700 mb in the center of developing tropical cyclones and associated intensity changes was first explored by Sikora (ATR 1975) with a follow-on study by Milwer (ATR 1976). These two studies produced conflicting results, but a subsequent study by Hassebrock (ATR 1977) showed that there was a relationship between changes in equivalent potential temperature and subsequent changes in tropical cyclone intensity. The tropical cyclones of 1976-78 have been used to evaluate the relationship and there is evidence that the techniques developed by Hassebrock have some merit. In order to widen the data base, the techniques will be evaluated for the 1979 tropical cyclone season, and also for tropical cyclones occurring prior to 1976.

4. OBJECTIVE TROPICAL CYCLONE INITIAL POSITIONING WITH A WEIGHTED LEAST SQUARES ALGORITHM

(Lubeck, O. M. and Shewchuk, J. D., FLEWEACEN/JTWC)

Recent studies indicate tropical cyclone forecast errors through 72 hours can be reduced by more accurate initial warning position estimates. This study is an attempt to develop an objective and standardized method of determining initial position based on all available fix information and their respective accuracies. The method employed is a least squares fit to the available fix data with a weighting scheme which is inversely proportional to the stated fix accuracies. This method can also be extended to objectively determine tropical cyclone best tracks.

5. ESTABLISHMENT OF THE JTWC TROPICAL CYCLONE DATA BASE

(Curry, W. T., FLEWEACEN/JTWC)

A data base of climatological data related to each tropical cyclone in the western North Pacific, Arabian Sea and Bay of Bengal from 1966 through 1978 is being established on FNWC computer mass storage systems. Included are 6-hour best track positions (intensities, direction and speed of movement); 24-, 48-, 72-hour objective technique forecasts and official forecasts of JTWC; and tropical cyclone fix data (position, intensities, platform, etc.). This data will be maintained on disk and tape files at FNWC Monterey, California and updated annually.

6. NEDS/COMPUTER APPLICATIONS

(Staff, FLEWEACEN/JTWC)

The advent of the Naval Environmental Display Station (NEDS) at FLEWEACEN Guam has provided the JTWC access to the large general purpose computer system at FNWC. Impact of the NEDS on operations at the JTWC has been studied and a NEDS implementation plan has been drawn up which includes existing operational requirements as well as future capabilities allowed by the NEDS.

Considerable automation of time consuming computational tasks has been accomplished with computer programs written to execute at FNWC. Existing post-analysis programs originally coded to execute on FWC Guam's CDC 3100 computer have been converted to execute at FNWC. In addition, numerous new features have been added to the programs.

NEDS graphics capability is being developed to depict forecast tracks from objective techniques. Establishment of a tropical cyclone data base on FNWC mass storage devices has been initiated and contract work has resulted in conversion of JTWC's objective techniques to execute on FNWC computers. Considerable effort has been expended to evaluate and monitor the program conversions.

7. BASIC STREAMLINE ANALYSIS AND TROPICAL CYCLONE FORECASTING TECHNIQUES GUIDE

(Guay, G., FLEWEACEN/JTWC)

A case study taken from an active tropical cyclone period has been initiated. The study will be worked into a guide to train new assignees in streamline analysis and the use of all available tropical cyclone forecasting techniques. The guide will also be used in STORMEX training (training scenarios for Det 4 HQAWS, 54 WRS, JTWC and AJTWC personnel).

8. STATISTICAL EVALUATION OF JTWC OBJECTIVE TECHNIQUES

(Lubeck, O. M., FLEWEACEN/JTWC)

Present forecast aids used by the typhoon duty officer include many objective techniques. Little information beyond annual average errors, however, is known about the techniques. A statistical evaluation is being accomplished in hopes of finding systematic biases and confirming/denying previous subjective determinations.

9. JTWC FORECAST CONFIDENCE STATEMENTS

(Hassebrock, A. W., Ihli, C. B., Jr. and Lubeck, O. M., FLEWEACEN/JTWC)

JTWC developed and implemented procedures for computing objective, probability confidence statements as a result of requirements stated at the 1978 Tropical Cyclone Conference. Forecast error probabilities were appended to Prognostic Reasoning Messages during the 1978 season. An evaluation of these confidence statements and Strike Probability Program (STRIKP) information (provided by NEPRF and FNWC Monterey) was performed and published in the 1979 Pacific Command Tropical Cyclone Conference Proceedings Report.

10. THE TRANSITIONING OF TROPICAL CYCLONES TO EXTRATROPICAL CYCLONES

(Guard, C. P., FLEWEACEN/JTWC and Brand, Samson, NEPRF)

Results of the examination of the post-recurrature transition of tropical cyclones to extratropical cyclones were published as NAVENVPREDRSCHFAC Technical Report TR 78-02, Extratropical Storm Evolution from Tropical Cyclones in the Western North Pacific Ocean in July 1978. Capt. Guard, now of AFGWC, Offutt AFB, NE, presented further results at the 12th Technical Conference on Hurricanes and Tropical Meteorology in April 1979 at New Orleans, LA. His report was entitled The Intensity of Recurring Western North Pacific Tropical Cyclones: A New Look. During 1979, the JTWC staff will be evaluating the rules-of-thumb generated from the research results.

ANNEX A - TROPICAL CYCLONE TRACK DATA

1. WESTERN NORTH PACIFIC CYCLONE TRACK DATA

TROPICAL STORM NADINE

(January)

WEST TRACK			SOUTHWARD			24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
POSIT	WIND	POSIT	WIND	UDS	WIND	POSIT	WIND	UDS	WIND	POSIT	WIND	UDS	WIND	POSIT	WIND	UDS	WIND	POSIT	WIND	UDS	WIND		
100182	7.0	164.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0		
100182	7.0	164.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0		
100182	7.0	163.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0		
100124	8.0	163.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0		
100124	8.0	162.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0		
100004	9.0	162.0	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0		
100004	9.0	162.0	30	9.3	161.7	25	19.	-5.	10.4	154.7	30.	127.	0.	4.3	155.9	35.	362.	-5.	9.6	150.8	40.	702.	-5.
100124	9.0	162.0	30	9.3	161.7	25	43.	-5.	10.1	161.2	30.	174.	0.	10.4	158.7	35.	180.	-5.	9.0	154.8	40.	564.	-10.
100182	10.0	162.0	30	9.3	161.7	25	77.	-5.	10.4	160.7	30.	202.	-7.	10.0	158.3	35.	239.	-10.	8.9	154.5	40.	644.	-15.
100004	10.0	162.0	30	10.0	163.1	25	18.	-5.	11.3	161.3	30.	215.	-7.	10.0	157.3	35.	280.	-10.	9.5	153.4	40.	779.	-5.
100004	10.0	161.0	30	10.0	161.7	25	32.	-5.	10.3	157.0	30.	220.	-10.	4.0	153.3	35.	225.	-10.	9.7	149.4	40.	10142.	-10.
100124	10.0	161.0	30	10.0	161.7	30	30.	13.	10.4	157.1	35.	297.	-7.	10.0	153.0	40.	385.	-10.	10.7	149.0	40.	51230.	-10.
100182	10.0	161.0	35	10.0	160.7	30	19.	-5.	9.6	158.7	40.	311.	-7.	10.0	152.0	40.	377.	-10.	10.8	149.1	40.	51420.	-10.
110004	11.0	161.0	35	11.0	161.7	35	22.	0.	12.0	158.4	40.	102.	-7.	12.0	159.8	45.	303.	-10.	11.2	150.8	40.	51396.	0.
110004	11.0	161.0	40	11.0	161.7	35	19.	-5.	12.2	157.9	45.	230.	-7.	12.0	159.0	45.	309.	-5.	9.0	150.0	40.	51400.	0.
111124	11.0	160.0	40	12.0	160.7	40	25.	0.	10.3	157.9	45.	223.	-7.	13.0	153.7	50.	318.	-10.	9.0	150.0	40.	51400.	0.
110104	13.0	160.0	45	13.0	159.7	45	13.	0.	15.2	158.4	50.	345.	-7.	13.0	153.2	50.	310.	-10.	9.0	150.0	40.	51400.	0.
111104	14.0	160.0	45	14.0	160.7	45	12.	0.	17.2	160.2	40.	234.	-7.	16.0	162.7	50.	354.	-15.	9.0	150.0	40.	51400.	0.
111104	15.0	160.0	45	15.0	161.0	45	24.	0.	18.3	160.4	50.	159.	-20.	0.0	0.	0.	0.	0.0	0.	0.	0.		
111124	15.0	161.0	45	16.0	161.4	45	6.	-5.	19.1	160.4	45.	230.	-15.	0.0	0.	0.	0.	0.0	0.	0.	0.		
111184	16.0	162.7	55	16.0	162.7	55	6.	0.	18.4	161.1	45.	222.	-15.	0.0	0.	0.	0.	0.0	0.	0.	0.		
110004	17.0	164.3	55	17.0	164.0	55	55.	14.	0.	19.6	170.5	55.	192.	-7.	16.0	160.0	55.	0.	0.0	0.	0.	0.	
110004	17.0	165.3	55	17.0	166.0	55	13.	0.	0.0	0.0	0.	0.	-5.	0.0	0.0	0.	0.	0.0	0.	0.	0.		
111124	18.0	158.6	60	18.0	168.0	55	55.	-5.	0.0	0.0	0.	0.	-5.	0.0	0.0	0.	0.	0.0	0.	0.	0.		
111124	20.0	170.0	60	20.0	170.7	60	8.	0.	0.0	0.0	0.	0.	-5.	0.0	0.0	0.	0.	0.0	0.	0.	0.		
111304	21.0	173.2	50	21.0	173.8	50	11.	0.	0.0	0.0	0.	0.	-5.	0.0	0.0	0.	0.	0.0	0.	0.	0.		

	ALL FORECASTS			
	MMAG	24-HH	48-HH	72-HH
Avg FOMELAST POSIT ENHON	7.3	185.	508.	980.
Avg Night Angle ENHON	15.	109.	381.	718.
Avg Intensity Magnitude ENHON	2.	7.	9.	11.
Avg Intensity Bias	-2.	-7.	-9.	-11.
Number of Forecasts	20	16	12	8

TYPHOON OLIVE

(April

BEST TRACK			WARNING			24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST				
POSIT	WIND	POSIT	ERRORS			POSIT	WIND	USI	1NU	ERRORS			POSIT	WIND	USI	1NU	POSIT	WIND	USI	1NU		
			WIND	DST	WIND					WIND	DST	WIND						WIND	DST	WIND	WIND	
912004	3d 149.0 15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
912004	3d 147.6 15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
912124	3d 146.2 15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
912184	4d 144.6 15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
910004	5d 143.5 15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
910002	5d 142.8 29	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
910122	5d 142.3 29	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
910182	5d 141.5 29	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
911004	6d 140.8 25	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
911002	6d 139.3 25	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
911122	7d 137.7 25	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
911782	7d 136.5 25	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.	0.	0.0	0.	0.	0.	0.0	0.	0.	0.	0.	
910002	8d 135.2 30	0.5	1.35	30	13.0	0.	10.5	130.3	0.	50.5	0.	12.5	0.	12.5	0.	55.5	88.	-5.	13.0	121.5	55.	10.5
910002	8d 133.9 30	8.9	13.0	30	13.0	0.	11.0	129.4	4.5	40.	0.	13.5	125.1	55.	138.	5.	14.0	121.3	50.	141.	50.	
910122	9d 132.6 30	9.0	13.2	30	21.0	0.	11.7	128.6	4.5	70.	0.	12.5	124.9	55.	137.	10.	14.2	120.5	50.	156.	0.	
910182	9d 131.2 35	9.2	131.5	35	21.0	0.	10.6	125.5	50.	35.	0.	12.0	122.6	55.	99.	10.	14.3	118.9	55.	112.	0.	
910002	9d 129.9 40	9.7	129.5	25	24.0	-5.	11.4	124.5	4.5	0.	20.0	125.5	120.7	40.	72.	5.	14.0	118.8	50.	26.	-10.	
910002	10d 128.6 45	10.1	128.6	25	13.0	0.	11.8	124.2	4.5	15.	0.	12.8	119.3	40.	42.	-5.	14.5	115.2	50.	12.	-15.	
911122	10d 127.9 50	10.4	127.9	25	16.0	0.	12.0	124.9	4.5	30.	0.	13.5	124.9	40.	39.	-10.	15.0	119.9	50.	12.	-20.	
911782	10d 126.0 55	10.9	126.2	25	13.0	-5.	12.3	122.0	4.5	71.	0.	13.5	118.4	40.	39.	-10.	15.1	115.6	50.	76.	-36.	
920002	11d 124.6 60	11.3	123.4	25	12.0	0.	12.7	121.4	4.5	10.	0.	13.9	117.6	40.	45.	10.	16.0	111.1	50.	29.	-35.	
920002	11d 123.4 50	11.5	123.2	25	27.0	0.	12.8	119.4	4.5	34.	0.	14.6	115.0	20.	35.	15.	16.0	111.2	55.	124.	-30.	
920122	12d 122.1 45	12.3	122.2	25	25.0	0.	13.0	117.1	4.5	15.	0.	14.0	113.8	30.	65.	-20.	16.1	110.1	55.	180.	-30.	
920182	12d 120.9 45	12.4	121.0	25	25.0	0.	14.6	116.9	50.	65.	0.	15.1	112.6	55.	40.	-25.	17.1	109.3	0.	225.	-25.	
920102	13d 119.7 45	13.2	119.6	45	6.0	0.	14.8	114.1	55.	110.	0.	16.2	110.6	60.	162.	-25.	17.4	107.3	0.	357.	-25.	
920102	13d 118.8 45	13.1	118.0	25	12.0	5.	13.5	114.5	4.5	60.	0.	15.8	110.3	35.	177.	-20.	18.0	107.2	0.	419.	-20.	
921122	13d 117.9 50	13.5	117.7	25	8.0	5.	14.3	113.9	45.	85.	0.	14.0	109.5	65.	252.	-20.	16.0	0.	0.	0.	0.	
921182	13d 117.1 55	13.5	116.4	25	13.0	0.	14.6	112.6	50.	115.	0.	14.8	108.1	50.	390.	-5.	17.0	0.	0.	0.	0.	
922002	13d 116.6 60	13.4	116.4	25	6.0	0.	15.1	113.3	55.	21.	0.	14.5	110.1	70.	228.	-15.	17.8	107.5	70.	655.	-50.	
922002	13d 115.6 65	12.0	115.9	25	8.0	0.	15.4	112.5	50.	116.	0.	14.8	110.1	40.	285.	-5.	18.3	107.9	80.	745.	10.	

92C122	14.0	114.0	70	14.0	114.0	70	12+	0+	16+5	111.0	15+	80+	10+	18+2	109.0	80+	383.	-5+	20+1	107.4	80+	886.	15+		
92C102	15.3	114.3	80	15.5	114.2	80	13+	0+	18+0	111.7	80+	80+	-5+	20+0	110.2	80+	398.	-20+	0+	0.0	0+	-0+	0+		
92D002	12+9	113.6	85	16.0	113.5	85	8+	0+	18+4	111.3	85	120+	0+	21+0	110+9	85+	464.	-10+	23+4	112.1	4+	847.	-15+		
92D004	10+4	113.2	85	16.7	113.0	85	2+	0+	19+1	111.2	85	180+	0+	21+1	111.1	80+	540.	-10+	0+	0.0	0+	-0+	0+		
92D122	17+0	113.1	85	17.0	112+0	85	17+	0+	19+2	111.4	85	20+	0+	21+1	111+1	70+	505.	10+	24+1	118.3	65+	726.	20+		
92D182	15+7	113.2	85	17.4	113+2	85	18+	0+	19+7	111.5	80	21+	0+	22+3	116+1	70+	516.	15+	25+0	120.2	65+	721.	25+		
92D002	18+0	113.2	85	18.5	113+0	85	8+	0+	21+7	111.1	80	15+	5+	24+5	120+3	70+	417.	15+	0+	0.0	0+	-0+	0+		
92D002	17+1	114.5	85	19.1	114+5	85	0+	0+	21+6	114.0	80	16+	10+	23+3	125+0	65+	252.	15+	0+	0.0	0+	-0+	0+		
92D122	17+7	116.0	85	19.7	115+7	85	17+	0+	21+4	120.8	75	135+	10+	23+4	127+2	65+	243.	20+	0+	0.0	0+	-0+	0+		
92D182	20+2	117.3	80	20+2	117+1	80	0+	0+	22+4	123+2	85	125+	5+	24+5	130+5	55+	169.	15+	0+	0.0	0+	-0+	0+		
92D002	20+1	118.7	75	20+9	118+7	75	12+	0+	23+1	125+7	90	125+	5+	0+	0+	0+	0+	0.0	0+	0.0	0+	-0+	0+		
92D122	21+2	120.0	70	21+4	120+2	70	35+	0+	23+6	127.0	90	150+	0+	0+	0+	0+	0+	0.0	0+	0.0	0+	0.0	-0+	0+	
92D122	21+5	123+2	65	21+5	123+7	65	24+	0+	23+6	130+6	45+	145+	0+	0+	0+	0+	0+	0.0	0+	0.0	0+	0.0	-0+	0+	
92D182	21+7	125+4	60	21+8	125+4	60	24+	0+	23+6	137.0	45+	205+	5+	0+	0+	0+	0+	0.0	0+	0.0	0+	0.0	0+	-0+	0+
92D002	22+0	127.4	55	22+0	127+5	55	6+	0+	0+	0+	0+	0+	-5+	0+	0+	0+	0+	0.0	0+	0.0	0+	0.0	0+	-0+	0+
92D002	22+5	129+5	50	22+2	129+3	50	21+	0+	0+	0+	0+	0+	-5+	0+	0+	0+	0+	0.0	0+	0.0	0+	0.0	0+	-0+	0+
92D122	22+9	131+5	45	22+8	131+3	45	13+	0+	0+	0+	0+	0+	-5+	0+	0+	0+	0+	0.0	0+	0.0	0+	0.0	0+	-0+	0+
92D182	23+3	133+3	40	23+3	133+8	40	27+	0+	0+	0+	0+	0+	-5+	0+	0+	0+	0+	0.0	0+	0.0	0+	0.0	0+	-0+	0+

ALL FORECASTS						TYPHOONS WHILE OVER 35 KTS					
#HNG	24-HR	48-HR	72-HR	#HNG	24-HR	48-HR	72-HR				
Avg Forecast Posit Error	14+	100	224+	328+	Avg High Angle Error	14+	100	224+	328+		
Avg Height Angle Error	10+	62+	129+	215+	Avg Intensity Magnitude ErrMAG	Y+	62+	129+	215+		
Avg Intensity Magnitude ErrHHR	1+	5+	14+	17+	Avg Intensity Bias	1+	5+	14+	17+		
Avg Intensity Bias	0+	-3+	-6+	-4+	Number of Forecasts	38	32	28	20		
						33	32	28	20		

TROPICAL STORM POLLY

(June)

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST										
POSIT	WIND	POSIT	POSIT	WIND	DST WIND	POSIT	WIND	DU1	WIND	DU1	WIND	POSIT	WIND	DST WIND								
013122	20+3 138.3	15	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
013182	21+2 137+3	15	0+0	0+0	0+	-5+	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
014004	22+4 136.3	20	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
014004	23+0 135.5	20	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
014122	23+3 134+5	20	0+0	0+0	0+	-5+	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
014182	24+3 133+8	20	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
015004	24+1 133+1	15	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
015004	24+7 132+7	15	0+0	0+0	0+	-5+	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
015122	23+3 132+3	15	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
015182	22+0 132+0	20	0+0	0+0	0+	-5+	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
016004	22+4 132+0	25	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
016004	23+0 132+0	25	0+0	0+0	0+	-5+	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
016122	23+5 131+0	25	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+	0+0	0+0	0+0	0+0							
016182	23+9 129+7	30	23+7 129+4	30	20+	25+5	124+	40+	124+	17+	24+3 123+5	45+	161.	5+	3u+9 126+7	35+	37+	-15+				
017004	24+4 128+9	30	24+3 128+3	30	21+	31+	28+0	124+0	40+	16+	10+	32+	127+0	40+	285.	0+	35+7 133.0	35+	378.	-10+		
017004	24+0 128+2	30	25+0 128+2	30	24+	27+4	124+0	30+	90+	5-	24+6	124+7	30+	111.	-15+	0+	0+	0+	-0+	0+		
017122	25+0 127+5	25	24+9 127+6	30	12+	5+	27+	125+1	30+	60+	-5+	29+2	125+0	30+	125.	-20+	0+	0+	-0+	0+		
017182	25+4 127+0	25	25+4 126+8	30	11+	5+	28+	126+7	30+	99+	-10+	3n+8 125+1	25+	78.	-25+	0+	0+	-0+	0+			
018004	26+1 126+3	30	26+5 125+8	30	3+	0+	29+	126+4	30+	150+	-10+	31+6 125+1	25+	112.	-20+	0+	0+	-0+	0+			
018004	26+9 126+1	35	25+6 126+0	35	8+	0+	28+	126+9	45+	7c+	0+	32+3 126+4	35+	127.	-5+	0+	0+	-0+	0+			
018004	26+5 126+1	35	26+6 126+0	35	8+	0+	29+	125+7	45+	30+	-5+	32+4 126+2	40+	114.	10+	0+	0+	-0+	0+			
019004	26+9 126+1	40	27+4 126+1	40	6+	0+	30+	126+6	50+	12+	0+	0+	0+	0+	0+	0+	0+	0+	0+	-0+	0+	
019004	27+5 126+0	40	27+4 126+0	40	6+	0+	29+	126+3	50+	11+	5+	0+	0+	0+	0+	0+	0+	0+	0+	0+	-0+	0+
019004	26+2 126+1	45	27+4 126+1	45	18+	0+	31+	127+4	50+	9+	10+	0+	0+	0+	0+	0+	0+	0+	0+	0+	-0+	0+
019122	27+1 126+4	50	29+1 126+5	50	5+	0+	33+	124+7	55+	80+	15+	0+	0+	0+	0+	0+	0+	0+	0+	0+	-0+	0+
019182	30+3 126.5	50	30+1 126+6	50	13+	0+	0+	0+	0+	0+	0+	-5+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
020004	31+5 127+3	45	31+7 127+2	45	11+	0+	0+	0+	0+	0+	0+	-5+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
020004	32+5 128+9	40	32+5 128+4	45	25+	5+	0+	0+	0+	0+	0+	-5+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+
020122	33+4 130+4	30	33+2 130+5	30	13+	0+	0+	0+	0+	0+	0+	-5+	0+	0+	0+	0+	0+	0+	0+	0+	0+	0+

ALL FORECASTS					
#HNG	24-HR	48-HR	72-HR		
Avg Forecast Posit Error	16+	93	139+	2nd.	
Avg Height Angle Error	10+	50	93+	47.	
Avg Intensity Magnitude ErrMAG	1+	8	13+	13.	
Avg Intensity Bias	1+	2	-4+	-13.	
Number of Forecasts	16	12	8	2	

AD-A070 904 FLEET WEATHER CENTRAL/Joint TYPHOON WARNING CENTER FP--ETC F/G 4/2
ANNUAL TYPHOON REPORT, 1978.(U)
1978 D R MORFORD, J K LAVIN

UNCLASSIFIED

NL

2 OF 2
AD
AO 70 904



TROPICAL STORM ROSE

(June)

BEST TRACK	WARNING						24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST						
	POSI	WIND	POSI	WIND	DST	WIND	POSI	WIND	DST	WIND	POSI	WIND	DST	WIND	POSI	WIND	DST	WIND	POSI	WIND	DST	WIND	POSI	WIND	
021002	16.0	129.4	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
021002	16.1	129.7	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
021002	17.3	129.0	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
021002	16.0	129.5	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
021002	16.1	127.8	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
021002	17.0	127.0	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
021002	17.0	126.4	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
021002	18.0	125.6	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
021002	16.0	124.0	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
021002	17.1	124.0	40	18.0	124.1	35	19.	0.0	19.0	124.0	35	18.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
021002	17.0	123.4	40	18.0	123.0	40	0.0	0.0	19.0	123.0	40	0.0	22.0	35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
021002	20.0	122.4	40	18.0	123.0	40	10.0	0.0	19.0	123.0	40	0.0	24.0	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
021002	21.0	122.0	35	21.0	122.0	35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
021002	22.0	122.0	35	22.0	122.0	35	32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
021002	23.0	121.0	35	22.0	121.0	35	21.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
021002	24.0	121.0	35	24.0	121.0	35	15.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ALL FORECASTS

WRNG 24-HR 48-HR 72-HR

Avg Forecast Posit Error
Avg Right Angle Error
Avg Intensity Magnitude Error
Avg Intensity Bias
Number of Forecasts

BEST TRACK	WARNING						24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST							
	POSI	WIND	POSI	WIND	DST	WIND	POSI	WIND	DST	WIND	POSI	WIND	DST	WIND	POSI	WIND	DST	WIND	POSI	WIND	DST	WIND	POSI	WIND		
020002	11.1	129.5	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	11.2	128.7	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	11.3	127.5	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	11.3	126.5	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	11.3	125.0	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	11.3	124.1	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	11.3	122.8	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	11.4	121.0	20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	10.7	119.0	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	10.6	117.0	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	10.5	117.0	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	10.8	117.0	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	10.5	117.0	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	10.6	116.0	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	11.4	115.2	25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	12.1	113.6	30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	12.0	112.2	35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	13.3	110.7	35	13.4	111.0	35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	13.5	109.3	35	13.4	109.5	35	13.	10.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
020002	14.1	108.1	30	13.7	108.1	30	24.	0.	0.0	0.0	0.0	0.	-0.5	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ALL FORECASTS

WRNG 24-HR 48-HR 72-HR

Avg Forecast Posit Error
Avg Right Angle Error
Avg Intensity Magnitude Error
Avg Intensity Bias
Number of Forecasts

TYphoon TRIX

(July)

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST						
POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	
T11002	18.0 153.8	20	0.0 0.0	0.	70+	0.	0.0 0.0	0.	-70+	0.	0.0 0.0	0.	-70-	0.	0.0 0.0	0.	-70-	0.
T11062	18.9 153.2	20	0.0 0.0	0.	70+	0.	0.0 0.0	0.	-70+	0.	0.0 0.0	0.	-70-	0.	0.0 0.0	0.	-70-	0.
T11122	19.0 152.6	20	0.0 0.0	0.	70+	0.	0.0 0.0	0.	-70+	0.	0.0 0.0	0.	-70-	0.	0.0 0.0	0.	-70-	0.
T11182	19.3 152.1	25	0.0 0.0	0.	70+	0.	0.0 0.0	0.	-70+	0.	0.0 0.0	0.	-70-	0.	0.0 0.0	0.	-70-	0.
T11202	19.0 151.1	25	0.0 0.0	0.	70+	0.	0.0 0.0	0.	-70+	0.	0.0 0.0	0.	-70-	0.	0.0 0.0	0.	-70-	0.
T11262	20.5 150.2	25	0.0 0.0	0.	70+	0.	0.0 0.0	0.	-70+	0.	0.0 0.0	0.	-70-	0.	0.0 0.0	0.	-70-	0.
T11282	21.0 149.5	25	0.0 0.0	0.	70+	0.	0.0 0.0	0.	-70+	0.	0.0 0.0	0.	-70-	0.	0.0 0.0	0.	-70-	0.
T11302	22.3 148.6	25	0.0 0.0	0.	70+	0.	0.0 0.0	0.	-70+	0.	0.0 0.0	0.	-70-	0.	0.0 0.0	0.	-70-	0.
T11302	23.1 147.6	30	0.0 0.0	0.	70+	0.	0.0 0.0	0.	-70+	0.	0.0 0.0	0.	-70-	0.	0.0 0.0	0.	-70-	0.
T11302	23.2 146.5	30	23.7 146.7	25	42+	-5	26.8 142.7	35	180+	0	29.1 139.2	40	329+	-10	30.4 135.4	45	488	-20
T11302	23.0 145.6	30	24.5 145.5	25	42+	-5	27.2 141.7	35	191+	0	28.7 137.6	40	320+	-15	31.4 133.3	45	556	-20
T11302	23.0 144.3	30	24.1 144.5	25	42+	-5	25.5 140.6	35	80+	-10	26.6 136.0	40	228+	-20	27.0 131.7	45	483	-20
T11402	23.0 143.3	35	24.3 143.1	25	42+	-10	25.5 139.0	35	97+	-15	24.5 134.7	40	266+	-25	26.8 130.1	45	566	-20
T11402	23.8 142.4	35	26.0 142.3	30	13+	-5	25.3 138.1	40	110+	-10	24.0 133.5	45	310+	-20	26.4 129.1	50	629	-20
T11422	23.0 141.6	40	23.9 141.7	30	8+	-10	24.6 137.7	40	79+	-15	24.2 133.2	45	321+	-20	25.6 128.3	50	690	-20
T11402	24.1 140.7	45	23.4 140.8	35	13+	-10	24.0 136.8	40	77+	-20	24.1 132.1	45	381+	-20	23.9 127.5	50	76%	-15
T11502	23.0 139.7	50	24.2 140+0	35	20+	-15	24.0 136.5	45	110+	-20	24.7 132.6	50	389+	-15	24.7 128.1	55	79%	-10
T11502	23.0 138.9	50	23.2 138+0	60	12+	10	24.3 139.0	55	182+	0	24.6 130+7	70	515+	0	24.7 126.3	75	96%	15
T11512	23.0 138.3	55	23.5 137+0	60	23+	5	23.5 136+0	65	232+	0	23.7 129.7	70	601+	0	24.4 125.5	75	105+	20
T11512	23.2 137.9	60	23.3 137+0	60	18+	0	22.5 136+0	65	239+	0	23.4 130+2	70	621+	5	24.3 126.1	75	104%	20
T11602	22.7 137.6	65	22.6 137+1	60	28+	-5	22.2 136+1	65	243+	0	22.2 131+0	70	627+	5	22.2 127.8	80	101%	20
T11602	22.5 137.7	65	22.6 137+0	65	13+	0	22.0 137+0	75	190+	5	22.9 137+0	80	372+	20	22.3 134.8	80	69%	20
T11622	22.1 138+0	65	22.1 138+0	65	11+	0	22.1 138+0	75	134+	5	22.9 136+9	80	457+	25	22.3 134.6	80	66%	20
T11622	21.9 138+6	65	21.8 138+3	65	18+	0	21.8 138+3	75	191+	10+	22.4 138+0	80	434+	25	22.8 136.0	80	56%	30
T11702	22.1 139+1	65	22.0 138+0	65	18+	0	22.7 139+8	75	166+	10+	24.7 141+2	80	272+	25	27.0 141.4	80	162%	35
T11702	22.0 139+8	70	22.5 139+0	70	6+	0	24.6 141+0	90	165+	30+	27.7 140+9	95	300+	40	30.7 139.8	95	157%	55
T11702	22.7 137+7	70	23.2 137+0	70	34+	0	26.1 141+3	90	205+	35	29.9 140+9	95	301+	40	32.1 139.2	95	164%	55
T11702	23.0 137+6	65	22.9 137+1	70	28+	-5	22.2 137+1	75	190+	20+	28.5 142+8	80	101+	30	31.4 141.2	80	180%	45
T11802	23.0 137+7	65	22.9 137+1	70	25+	5	27.0 141+7	75	134+	20+	30.0 143+2	80	69+	35	32.5 143.0	80	337%	45
T11802	24.0 144+0	60	24.2 144+2	65	11+	5	27.2 147+5	90	69+	5	31.2 147+2	95	280+	15	34.0 147.6	90	663%	15
T11822	23.2 144+9	55	25.0 145+1	60	28+	0	30.2 146+6	95	184+	-20	32.0 146+6	100	592+	-10	35.0 146.5	105	765%	-15
T11822	25.0 145+4	55	26.0 146+0	55	40+	0	29.3 146+0	95	185+	-15	32.4 147+3	100	479+	-5	35.0 146.0	0	-0%	0
T11902	26.1 146+0	55	25.5 145+4	55	36+	0	27.1 147+5	90	222+	-5	36.4 148+0	105	500+	0	33.8 148.7	105	1n46%	-10
T11902	26.0 146+4	55	26.7 146+7	55	17+	0	30.0 148+0	90	320+	0	34.1 149+1	105	735+	0	36.7 151.3	115	1312%	-15
T11912	27.3 145+6	55	27.7 146+5	55	53+	0	32.2 146+6	90	349+	0	34.8 147+8	105	826+	0	0.0 0.0	0	-0%	0
T11912	28.0 144+7	50	28.2 144+5	55	11+	5	32.3 142+2	95	237+	10+	35.5 143+5	105	737+	0	0.0 0.0	0	-0%	0
T12002	28.9 143+0	45	29.3 143+0	50	24+	5	33.0 141+5	90	329+	5	37.1 143+7	95	890+	0	0.0 0.0	0	-0%	0
T12002	29.2 142+3	40	29.4 142+1	40	12+	0	31.1 137+0	95	167+	0	33.0 132+2	30	374+	-10	35.0 146.5	20	765%	-15
T12012	29.0 140+5	40	30.2 140+6	40	36+	0	32.0 135+0	95	217+	0	0.0 0.0	0	0.0 0.0	0	0.0 0.0	0	-0%	0
T12012	29.1 138+7	35	29.7 138+4	35	5+	0	31.2 132+0	30	158+	-5	0.0 0.0	0	-0%	0	0.0 0.0	0	-0%	0
T12012	29.1 137+2	35	29.7 137+1	35	8+	0	29.7 131+4	30	137+	-5	29.0 128+8	30	277+	0	0.0 0.0	0	-0%	0
T12012	29.0 135+6	35	29.8 135+4	35	16+	0	29.5 130+2	30	179+	-10	0.0 0.0	0	-0%	0	0.0 0.0	0	-0%	0
T12112	29.0 133+2	35	29.8 133+3	35	50+	0	29.3 128+2	35	189+	-10	0.0 0.0	0	-0%	0	0.0 0.0	0	-0%	0
T12112	29.0 131+8	35	28.5 131+0	30	22+	-5	28.8 128+7	40	122+	-25	0.0 0.0	0	-0%	0	0.0 0.0	0	-0%	0
T12112	28.6 129+1	35	28.5 128+9	30	12+	-5	0.0 0.0	0	-70+	0	0.0 0.0	0	-0%	0	0.0 0.0	0	-0%	0
T12112	28.5 126+7	45	28.7 126+4	30	20+	-15	0.0 0.0	0	-70+	0	0.0 0.0	0	-0%	0	0.0 0.0	0	-0%	0
T12112	28.7 123+0	45	0.0 0.0	0.	-70+	0	0.0 0.0	0.	-70+	0	0.0 0.0	0.	-0%	0.	0.0 0.0	0.	-0%	0.
T12202	29.3 121+5	30	0.0 0.0	0.	-70+	0	0.0 0.0	0.	-70+	0	0.0 0.0	0.	-0%	0.	0.0 0.0	0.	-0%	0.

ALL FORECASTS

WIND 24-HR 48-HR 72-HR

AVG FORECAST POSIT ERROR

21. 174. 425. 657.

AVG RIGHT ANGLE ERROR

17. 122. 298. 531.

AVG INTENSITY MAGNITUDE ERROR

4. 10. 15. 25.

AVG INTENSITY RAD

-2. -1. 3. 9.

NUMBER OF FORECASTS

38 35 30 24

TYPHONS WHILE OVER 35 KTS

WIND 24-HR 48-HR 72-HR

20. 174. 431. 657.

16. 122. 308. 531.

4. 10. 15. 25.

0. -1. 3. 9.

35 75 29 24

TYPHOON VIRGINIA

(July-August)

ALBERTO CASI

ALL FORECASTS

AVG FUNDLAST POSIT ENHO

AVU NIGMI ANULU ENNU

AVG INTENSITY MAGNITUDE
AVG INTENSITY MAG.

**AVG INTENSITY BIAS
NUMBER OF PUNCTA/S**

REFERENCES

LAWRENCE COUNTY VOL. 12, NO. 1

WINGS 2A-10H 4P-10H 7P-10H

600 1170 2315 3994

120. 63. 127. 483.

6. 7. 11. 13.
22. 23. 23. 123.

43 14 25 31

TYPHOON WENDY

(July-August)

ALL FORECASTS

Avg Forecast Posit Errnch
 Avg Height Angle Errnch
 Avg Intensity Magnitude Errnch
 Avg Intensity Htas
 Number of Forecasts

TYPHOONS WHILE OVER 35 KI
M/HG 24-HH 48-HH 72-H

	78-90	45-50	12-
C1.	112.	235.	328.
C2.	15.	185.	269.
C3.	6.	12.	11.
U.	0.	~6.	3.
G.	36	30	19

TROPICAL STORM AGNES

(July)

ALL FORECAST

WHR G	48-HH	48-HH	72-HH
10.	97.	243.	410.
7.	59.	191.	304.
3.	8.	15.	6.
1.	-5.	-13.	-4.
22	19	12	3

TROPICAL STORM BONNIE

(August)

ALL FORECASTS
WMAG 14-HR 40-MIN 72-HR
31- 121- 8- 8-

Avg. Forearm Strength Error: .011, .121, .0+, .0+
 Avg. Joint Angle Error: .20, .36, .0+, .0+
 Avg. Intensity Magnitude Error: .10, .3, .0+, .0+
 Avg. Intensity Rms: .1, .0, .0+, .0+
 Number of Forecasts: 8, 4, 0, 0

TYPHOON CARMEN

(August)

HGT	TRACK	WARNING			24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
		PUS1T	WIND	PUS1T	WIND	PUS1T	WIND	DST	WIND	PUS1T	WIND	DST	WIND	PUS1T	WIND	DST	WIND	PUS1T	WIND	WIND	WIND	
0110122	10.0	145.5	E0	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.
0110182	10.0	145.1	E0	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.
0110202	10.0	144.9	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.
0110202	10.0	144.0	40	15.0	144.3	40	29.0	144.3	40	15.0	144.3	55	11.0	-0.0	16.0	149.0	55	20.0	146.0	146.0	146.0	146.0
0111222	10.0	144.4	45	15.7	144.0	45	24.0	144.0	45	15.4	141.9	50	12.0	-0.0	17.0	159.0	50	20.5	15.0	156.1	156.1	156.1
0111242	10.0	144.4	50	15.8	144.2	50	11.0	-0.5	15.8	143.6	50	19.0	-0.0	16.0	141.0	50	20.0	15.0	159.2	159.2	159.2	
0120042	10.1	144.6	55	15.9	144.1	55	13.0	0.0	15.8	141.6	55	20.0	-0.0	16.0	141.0	55	21.0	15.0	157.0	157.0	157.0	
0120202	10.0	143.9	60	16.0	144.0	60	13.0	-0.5	18.0	142.0	60	20.0	-0.0	19.0	140.0	60	20.0	15.0	157.6	157.6	157.6	
0121222	10.0	143.3	60	17.0	143.0	60	29.0	143.0	60	20.0	141.0	55	21.0	-0.0	22.0	138.0	55	30.0	154.0	154.0	154.0	
0121242	10.0	142.6	55	18.5	142.0	55	21.0	0.0	20.0	134.0	55	20.0	-0.0	21.0	130.0	55	20.0	153.0	153.0	153.0		
0130042	20.0	141.1	60	19.0	141.0	60	13.0	-0.5	22.0	130.0	55	12.0	-0.0	23.0	132.0	55	21.0	20.0	24.0	24.0	24.0	
0130202	21.0	139.7	65	20.9	139.7	65	16.0	0.0	23.0	130.0	60	17.0	-0.0	24.0	129.0	60	20.0	21.0	24.0	24.0	24.0	
0131222	22.0	137.9	65	22.0	138.0	65	16.0	0.0	23.0	132.0	60	17.0	-0.0	24.0	127.0	60	21.0	20.5	22.0	22.0	22.0	
0131242	22.0	136.6	65	22.0	136.6	65	13.0	0.0	24.0	130.0	60	10.0	-0.0	25.0	125.0	60	17.0	20.5	22.0	22.0	22.0	
0140042	23.0	134.9	70	23.2	134.6	70	20.0	0.0	24.0	127.0	60	12.0	-0.0	25.0	121.0	60	19.0	20.0	21.0	21.0	21.0	
0140122	24.0	133.0	70	24.0	133.0	70	6.0	0.0	26.0	126.0	60	5.0	-0.0	26.0	121.0	60	15.0	0.0	0.0	0.0	0.0	
0140142	25.0	131.9	70	25.0	131.7	70	12.0	0.0	27.0	124.0	60	5.0	-0.0	28.0	120.0	60	22.0	21.0	22.0	22.0	22.0	
0140182	25.0	130.2	75	25.0	130.1	70	6.0	-0.5	29.0	124.0	60	0.0	-0.0	31.0	120.0	60	22.0	21.0	22.0	22.0	22.0	
0140202	26.0	128.1	70	26.0	128.4	70	12.0	-0.5	29.0	122.0	60	11.0	-0.0	30.0	120.0	60	20.0	20.0	20.0	20.0	20.0	
0140222	27.0	127.3	70	27.0	127.2	70	6.0	-0.5	29.0	121.0	60	12.0	-0.0	30.0	120.0	60	20.0	20.0	20.0	20.0	20.0	
0141222	27.0	125.9	80	27.6	125.8	70	8.0	-0.5	29.0	120.0	60	10.0	-0.0	30.0	120.0	60	20.0	20.0	20.0	20.0	20.0	
0141242	28.0	124.6	75	28.0	124.6	75	10.0	0.0	30.0	120.0	60	8.0	-0.0	30.0	120.0	60	20.0	20.0	20.0	20.0	20.0	
0140042	28.0	123.0	75	28.0	123.0	75	11.0	0.0	29.0	120.0	60	10.0	-0.0	29.0	120.0	60	20.0	20.0	20.0	20.0	20.0	
0140062	28.0	123.4	75	28.5	122.9	75	26.0	0.0	29.0	120.0	60	8.0	-0.0	29.0	120.0	60	20.0	20.0	20.0	20.0	20.0	
0140122	28.0	123.2	75	28.5	122.0	75	24.0	0.0	29.0	120.0	60	10.0	-0.0	29.0	120.0	60	20.0	20.0	20.0	20.0	20.0	
0140142	28.0	122.7	70	28.0	122.0	65	15.0	-0.5	29.0	121.0	60	10.0	-0.0	29.0	121.0	60	20.0	20.0	20.0	20.0	20.0	
0140182	28.0	122.0	65	28.0	122.0	65	30.0	0.0	29.0	123.0	60	30.0	10.0	32.0	126.0	60	18.0	5.0	34.0	129.5	*0.0	
0141042	28.0	121.8	60	28.5	122.0	60	13.0	0.0	29.0	123.5	60	8.0	-0.0	32.0	126.0	60	12.0	5.0	34.0	0.0	0.0	
0141122	28.0	120.9	55	28.5	122.0	60	12.0	0.0	29.0	123.5	60	8.0	-0.0	32.0	126.0	60	12.0	5.0	34.0	0.0	0.0	
0141142	28.0	120.3	55	28.5	122.0	60	12.0	0.0	29.0	123.4	60	8.0	-0.0	32.0	126.0	60	12.0	5.0	34.0	0.0	0.0	
0140042	28.0	123.5	50	29.0	123.5	50	24.0	0.0	30.0	124.0	60	8.0	-0.0	33.0	126.0	60	4.0	4.0	34.0	0.0	0.0	
0140062	28.0	123.7	50	28.0	123.0	50	20.0	0.0	30.0	124.0	60	8.0	-0.0	32.0	126.0	60	5.0	5.0	34.0	0.0	0.0	
0140122	28.0	124.1	45	28.3	124.0	45	13.0	0.0	30.0	125.1	45	8.0	-0.0	32.0	126.0	45	0.0	0.0	34.0	0.0	0.0	
0140142	28.0	124.1	45	28.4	124.1	45	19.0	0.0	30.0	125.2	45	8.0	-0.0	32.0	126.0	45	0.0	0.0	34.0	0.0	0.0	
0140182	28.0	124.5	45	28.2	124.7	45	14.0	0.0	31.0	125.0	45	20.0	-0.0	30.0	126.0	45	0.0	0.0	34.0	0.0	0.0	
0140042	28.0	125.1	45	28.0	124.7	45	32.0	0.0	30.0	126.0	45	20.0	-0.0	30.0	126.0	45	0.0	0.0	34.0	0.0	0.0	
0140062	28.0	125.0	45	30.0	125.0	45	4.0	0.0	30.0	126.0	45	20.0	-0.0	30.0	126.0	45	0.0	0.0	34.0	0.0	0.0	
0140122	28.0	125.0	40	31.0	126.0	40	6.0	0.0	30.0	126.0	40	20.0	-0.0	30.0	126.0	40	0.0	0.0	34.0	0.0	0.0	
0200002	30.0	126.0	30	34.0	126.0	30	21.0	0.0	30.0	126.0	0.0	0.0	-0.0	30.0	126.0	0.0	0.0	0.0	0.0	0.0	0.0	

	ALL FORECASTS			TYPHOONS WHILE OVER 35 KTS				
	WIND	24-HR	48-HR	72-HR	WIND	24-HR	48-HR	72-HR
Avg Forecast Posit Error	19°	124°	250°	429°	19°	122°	239°	456°
Avg High Angle Error	10°	56°	129°	246°	10°	54°	131°	278°
Avg Intensity Magnitude Errror	1°	6°	7°	3°	1°	6°	1°	2°
Avg Intensity Bias	-1°	-3°	-3°	0°	0°	-3°	-4°	-6°
Number of Forecasts	36	31	19	12	35	29	18	11

TROPICAL STORM DELTA

(August)

	ALL FORECASTS			
	WMMG	74-MR	48-HR	72-HR
Avg Forecast Posit Error	29.	116.	217.	0.
Avg High Angle Error	20.	73.	131.	0.
Avg Intensity Magnitude Errror	1.	16.	30.	0.
Avg Intensity Bias	-1.	16.	30.	0.
Number of Forecasts	10	6	2	0

TROPICAL DEPRESSION 14

(August)

BEST TRACK	WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST				
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
014002	9.0	162.2	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
014002	9.0	161.0	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
014122	10.0	159.6	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
014102	11.0	158.6	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
015002	14.7	157.5	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
015002	13.0	156.7	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
015122	14.0	155.6	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
015102	15.0	154.0	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
016002	16.1	154.0	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
016002	17.0	153.0	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
016122	17.0	152.2	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
016102	16.7	151.3	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
017002	19.0	150.7	10	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
017002	20.0	150.4	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
017122	20.0	149.9	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
017102	21.3	149.4	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
018002	21.9	148.9	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
018002	23.0	147.5	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
018122	23.9	145.9	20	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
018102	25.7	143.2	25	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
019002	25.0	141.1	30	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.
019002	26.7	139.1	30	26.7	139.0	30.	5.	0.	30.9	132.4	35.	147.	10.	0.
019122	26.0	137.5	30	27.8	137.0	30.	13.	0.	32.2	132.0	35.	149.	15.	0.
019102	27.0	136.1	30	28.4	135.2	30.	76.	0.	34.0	130.0	35.	150.	15.	0.
020002	30.9	135.0	30	31.0	135.1	30.	8.	0.	34.0	130.0	35.	150.	15.	0.
020002	32.0	134.5	25	32.3	134.5	25.	18.	0.	34.0	130.0	35.	150.	15.	0.
020122	33.0	134.5	20	34.5	133.9	25.	30.	5.	34.0	130.0	35.	150.	15.	0.

ALL FORECASTS													
MEAN	24-HR	48-HR	72-HR										
AVG FORECAST POSIT ERROR	25.	169.	0.	0.									
AVG HIGH ANGLE ERROR	23.	127.	0.	0.									
AVG INTENSITY MAGNITUDE ERROR	1.	13.	0.	0.									
AVG INTENSITY BIAS	1.	13.	0.	0.									
NUMBER OF FORECASTS	6	7	0										

TYPHOON ELAINE

(August)

HIST TRACK	WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST				
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
B18004	9.0 135.5	15	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B18004	9.5 135.2	18	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B18122	10.0 135.0	15	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B18122	10.5 134.9	15	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B17004	11.0 134.7	16	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B17004	11.5 134.4	17	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B17122	11.5 134.0	15	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B17122	11.5 133.6	15	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B20004	11.0 133.0	15	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B20004	12.0 132.3	15	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B20122	13.0 131.8	15	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B20122	14.0 130.9	20	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B21004	14.0 130.1	20	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B21004	12.0 129.2	20	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B21122	10.0 128.2	20	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B21122	10.0 127.3	25	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B22004	10.0 126.5	25	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B22004	17.0 125.8	25	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B22122	17.0 125.2	25	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B22122	17.0 124.6	25	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B23004	18.0 123.8	25	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B23004	18.0 123.1	25	18.0 123.2	25	0.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B23122	18.0 122.4	25	18.0 122.3	25	19.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B23122	17.0 121.5	30	18.0 121.5	30	18.0 4.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B23004	17.0 120.7	35	17.0 120.3	35	26.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B24004	17.0 120.0	40	17.0 119.7	40	21.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B24122	17.0 119.3	40	16.0 119.2	40	8.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B24122	17.0 119.1	40	16.0 118.8	40	34.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B25004	17.0 118.5	40	17.0 118.0	40	29.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B25004	17.0 117.9	45	17.0 118.1	45	13.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B25122	17.0 118.1	45	17.0 118.1	45	6.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B25122	17.0 117.8	50	17.0 118.1	50	25.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B26004	18.0 117.1	55	18.0 116.8	55	21.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B26004	18.0 116.3	55	18.0 115.7	55	38.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B26122	19.0 115.3	60	19.0 115.2	60	6.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B26122	19.0 114.3	60	20.2 114.2	60	25.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B27004	20.0 112.8	60	20.2 112.9	60	8.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B27004	20.0 111.8	65	20.7 111.8	65	12.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B27122	21.0 110.4	65	21.0 110.4	65	23.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B27122	21.0 108.7	50	21.0 109.4	50	4.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0
B28002	21.0 107.1	30	21.7 106.7	30	21.0 0.0	0.0 -0.	0.0 0.0	0.0 -0.	0.0	0.0	0.0 0.0	0.0 -0.	0.0	0.0

Avg Forecast Posit Error
Avg Right Angle Error
Avg Intensity Magnitude Error
Avg Intensity Bias
Number of Forecasts

All Forecasts

WIND 24-HR 48-HR 72-HR

22.0 132.0 278.0 263.0

Typhoons While Over 35 Kts

WIND 24-HR 48-HR 72-HR

21.0 137.0 278.0 224.0

TYPHOON FAYE

	ALL FORECASTS				TYPHOONS WHILE OVER 35 KTS			
	BMAG	24-HR	48-HR	72-HR	BMAG	24-HR	48-HR	72-HR
Avg Forecast Posit Error	15°	158°	300°	514°	15°	158°	300°	514°
Avg Height Angle Errror	12°	113°	285°	346°	12°	113°	285°	346°
Avg Intensity Magnitude Errror	4%	17%	21%	26%	5%	17%	21%	26%
Avg Intensity Bias	2%	5%	3%	4%	0%	5%	3%	4%
Number of Forecasts	94	40	36	29	92	40	36	29

TROPICAL STORM GLORIA

(August-September)

BEST TRACK		WARNING			24 HOURS FORECAST			48 HOURS FORECAST			72 HOURS FORECAST			
		POSIT	WIND	ERRHRS	POSIT	WIND	ERRHRS	POSIT	WIND	ERRHRS	POSIT	WIND	ERRHRS	
020122	2004	130°.4	20	0.0	0.0	0°	0.0	0.0	0°	-0.2	0.0	0.0	0.0	0.0
020122	2004	129°.8	25	0.0	0.0	0°	0.0	0.0	0°	-0.2	0.0	0.0	0.0	0.0
020122	2004	129°.3	25	0.0	0.0	0°	0.0	0.0	0°	-0.2	0.0	0.0	0.0	0.0
020122	2102	128°.5	25	213.1	128°.7	30°	16°	5.	221.0	128°.4	90°	200°	0.0	0.0
020122	2202	128°.0	30	21.0	128°.2	30°	34°	0.	221.0	128°.5	90°	210°	0.0	0.0
020122	2301	128°.0	35	22.5	127°.4	35°	49°	0.	23.0	125°.8	95°	221.0	110°	25.1
020122	2301	128°.3	40	24.2	128°.4	90°	36°	0.	27.7	130°.7	95°	70°	15°	0.0
020122	0202	128°.5	40	24.6	128°.5	90°	0.	0.	27.0	129°.8	95°	20°	15°	0.0
020122	0202	128°.6	40	25.2	128°.9	90°	20°	0.	28.1	124°.9	90°	71°	10°	0.0
020122	0303	128°.0	35	26.4	128°.5	30°	17°	0.	30.3	128°.8	35°	19°	10°	0.0
020122	0303	127.2	30	27.5	129°.2	30°	21°	0.	0.0	0.0	0°	-0.2	0.0	0.0
020122	0303	130°.2	30	28.0	130°.1	30°	5°	0.	0.0	0.0	0°	-0.2	0.0	0.0
021122	2008	131°.0	30	28.7	130°.4	30°	12°	0.	0.0	0.0	0°	-0.2	0.0	0.0
021122	2008	131°.0	25	29.5	131°.1	30°	20°	5.	0.0	0.0	0°	-0.2	0.0	0.0

ALL FORECASTS

	WING	24-HR	48-HR	72-HR
Avg FUMECAST POSII FRRHOR	21.	138.	0.	0.
Avg Miami Angle Errror	13.	79.	331.	0.
Avg Intensity Magnitude Errhor	1.	9.	27.	0.
Avg Intensity Bias	1.	9.	27.	0.
Number of Forecasts	11	7	3	0

TROPICAL STORM HESTE

(August-September)

HFSI TRACK			WARNING			24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST			
POSIT	IND	POSIT	WIND	DIR	WIND	POSIT	IND	DIR	WIND	POSIT	IND	DIR	WIND	POSIT	IND	DIR	WIND	POSIT	IND	DIR	WIND
82d042	26.8	150.8	29	0.0	0.0	0.	-0.	0.	0.0	0.	0.0	-0.	0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
82d122	27.7	150.2	25	0.0	0.0	0.	-0.	0.	0.0	0.	0.0	-0.	0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
82s042	28.4	149.8	25	0.0	0.0	0.	-0.	0.	0.0	0.	0.0	-0.	0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
82s042	28.5	149.2	25	0.0	0.0	0.	-0.	0.	0.0	0.	0.0	-0.	0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
82s122	29.0	149.0	39	0.0	0.0	0.	-0.	0.	0.0	0.	0.0	-0.	0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
82s122	30.1	149.1	39	0.0	0.0	0.	-0.	0.	0.0	0.	0.0	-0.	0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
82s122	30.4	149.5	35	0.0	0.0	0.	-0.	0.	0.0	0.	0.0	-0.	0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
82s122	31.4	149.8	40	31.3	150.4	40	0.0	26.0	0.	34.1	150.8	45	89	0.	37.2	150.3	45	30.0	5	0.0	0.0
83s042	32.6	150.2	45	32.4	150.4	40	0.	19.	-5.	35.6	151.4	45	25	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
83s042	33.0	150.7	45	33.0	150.4	45	4.5	5.0	0.	35.7	151.2	40	158	0.	35.0	0.0	0.	0.	0.0	0.	0.0
83s122	33.0	151.1	59	33.6	151.2	45	1.6	-5.	0.	36.0	151.3	45	310	5	0.0	0.0	0.	0.0	0.0	0.	0.0
83s122	34.0	152.1	50	34.4	152.3	45	1.5	-5.	0.	37.1	151.5	40	405	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
83s122	35.0	153.7	45	35.7	152.4	45	34	0.	0.	0.0	0.	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
83s122	37.0	156.0	45	36.6	156.0	45	30	0.	0.	0.0	0.	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
83s122	38.0	159.2	40	38.0	158.1	45	6.6	5	0.	0.0	0.	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
84s122	40.0	142.8	40	39.7	161.4	0	0.	85	0.	0.0	0.	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0

ALL FORECASTS

	WMMG	24-HR	48-HR	72-HR
Avg FumeCast Positi Errror	34.	198.	300.	0.
Avg Right Angle Errror	17.	28.	52.	0.
Avg Intensity Magnitude Errror	2.	3.	5.	0.
Avg Intensity Hid.	-1.	-1.	5.	0.
Number of Forecasts	9	5	1	0

TYPHOON IRMA

(September)

WEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST			
POSIT	WIND	POSIT	WIND	USTR WIND	POSIT	WIND	USTR	WIND	POSIT	WIND	USTR WIND	POSIT	WIND	USTR WIND	
YUW122	123.8	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW123	123.3	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW124	122.6	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW125	122.5	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW126	122.2	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW127	122.2	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW128	121.9	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW129	121.8	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW130	122.3	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW131	122.7	20	0.0	0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUW132	122.0	35	25.0	122.9	30.	-17.0	-28.0	124.7	40.	92.0	-11.0	52.1	127.0	45.	-15.0
YUW133	123.0	40	25.0	122.8	30.	-26.0	-18.0	125.0	55.	83.0	-0.0	51.0	127.5	60.	113.0
YUZ127	123.5	50	25.0	124.0	50.	-26.0	-28.7	125.1	55.	92.0	-0.0	51.0	127.0	60.	113.0
YUZ128	123.5	50	26.0	123.9	50.	-29.0	-29.7	125.0	55.	92.0	-0.0	52.0	127.3	60.	113.0
YUZ129	123.4	50	27.0	123.2	50.	-12.0	-30.0	124.1	55.	31.0	-0.0	53.0	127.2	55.	103.0
YUZ130	123.4	55	27.0	124.0	50.	-8.0	-30.0	124.9	60.	29.0	-0.0	53.0	127.0	55.	103.0
YUZ131	124.0	50	28.0	124.2	50.	-12.0	-31.0	126.1	60.	30.0	-0.0	53.0	129.3	50.	109.0
YUZ132	124.0	50	29.0	124.5	50.	-22.0	-32.0	126.0	60.	30.0	-0.0	54.0	129.3	50.	109.0
YUZ133	124.0	50	29.0	124.5	50.	-22.0	-32.0	126.0	60.	30.0	-0.0	54.0	129.3	50.	109.0
YUZ134	124.0	50	29.0	124.5	50.	-22.0	-32.0	126.0	60.	30.0	-0.0	54.0	129.3	50.	109.0
YUZ135	125.0	50	30.0	125.2	50.	-10.0	-33.0	127.4	65.	19.0	-2.0	55.0	129.3	50.	109.0
YUZ136	126.1	55	31.0	126.0	55.	-14.0	-34.0	124.3	65.	18.0	-0.0	56.0	129.0	50.	109.0
YUZ137	127.3	55	32.0	127.0	55.	-16.0	-35.0	130.4	60.	20.0	-0.0	57.0	130.0	50.	109.0
YUZ138	128.0	50	33.0	128.7	55.	-15.0	-0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUZ139	129.0	50	34.0	130.7	50.	-10.0	-0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUZ140	129.7	50	34.0	133.0	50.	-0.0	-0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0
YUZ141	129.5	50	34.0	135.0	50.	-0.0	-0.0	0.0	-0.0	0.0	0.0	0.0	0.0	0.0	0.0

AVG FORECAST POSIT ERROR	ALL FORECASTS				TYPHOONS WHILE OVER 35 KT			
	0-4H	4-8H	8-12H	12-24H	0-4H	4-8H	8-12H	12-24H
AVG HIGH ANGLE ERNHR	16.	92.	136.	154.	155.	71.	100.	160.
AVG INTENSITY MAGNITUDE ERNHR	12.	44.	31.	47.	13.	42.	34.	66.
AVG INTENSITY BIAS	5.	12.	11.	18.	5.	7.	6.	13.
NUMBER OF PREDICTS	15	12	8	6	14	10	6	2

TYPHOON JUDY

(September)

	ALL FORECASTS				IMPHUNO WHILE OVER J5 RT			
	WMMG	24-HR	48-HR	72-HR	WMMG	24-HR	48-HR	72-HR
Avg Forecast Posit Error	19.	127.	242.	366.	19.	127.	242.	366.
Avg Height Angle Error	12.	51.	131.	185.	12.	51.	131.	185.
Avg Intensity Magnitude Error	2.	17.	19.	16.	2.	17.	19.	16.
Avg Intensity Bias	-1.	-5.	-18.	-16.	0.	-5.	-18.	-16.
Number of Forecasts	18	16	10	5	18	16	10	6

TROPICAL STORM KIT

(September)

HIST TRACK	WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND
YCV004	13.0 133.6	15	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	7.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
YCV004	13.0 132.5	15	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	7.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
YCV124	13.9 131.2	20	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	7.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
YCV184	13.9 110.0	20	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	7.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
YCV004	13.9 129.0	20	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	7.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
YCV004	13.0 128.0	20	13.5 128.0	24	35.0 0.0	14.0 126.7	30.0 107.0	5.0 15.0	126.3 44.0	44.7 10	15.0 126.3	44.0 44.7	10.0 15.0	121.1 45.0	47.0 5	15.0 121.1 45.0 47.0 5
YCV124	14.0 127.0	25	13.6 128.1	25	0.0 0.0	14.1 126.1	35.0 225.0	10.0 15.0	123.4 44.0	44.1 5	15.0 123.4 44.0 44.1 5	15.0 120.3 44.0 47.0 5	10.0 15.0 119.0 44.0 46.2 -10			
YCV184	14.0 125.0	25	13.8 127.0	25	105.0 0.0	14.0 125.5	35.0 330.0	5.0 15.0	122.0 44.0	44.1 5	15.0 122.0 44.0 44.1 5	15.0 119.0 44.0 46.2 -10	10.0 15.0 117.3 44.0 44.1 5	17.0 113.1 45.0 136.0 -5		
YCV004	14.0 124.0	25	14.8 125.1	25	13.0 0.0	10.1 120.9	30.0 212.0	0.0 14.0	117.3 44.0	44.0 5	14.0 117.3 44.0 44.0 5	14.0 109.2 44.0 213.0 0	10.0 14.0 113.8 44.0 44.0 5	15.0 113.1 45.0 136.0 -5	15.0 109.2 44.0 213.0 0	
YCV124	14.0 122.0	25	14.8 123.0	25	14.0 0.0	15.0 118.5	30.0 177.0	0.0 14.0	113.8 44.0	44.0 5	14.0 113.8 44.0 44.0 5	14.0 108.2 44.0 213.0 0	10.0 14.0 112.6 44.0 44.0 5	15.0 112.6 44.0 213.0 0	15.0 108.2 44.0 213.0 0	
YCV184	14.0 118.0	30	14.5 119.0	30	53.0 0.0	10.1 117.1	40.0 104.0	5.0 14.0	112.6 44.0	44.0 5	14.0 112.6 44.0 44.0 5	14.0 109.0 44.0 213.0 0	10.0 14.0 110.1 44.0 44.0 5	15.0 110.1 44.0 213.0 0	15.0 109.0 44.0 213.0 0	
YCV004	14.0 116.0	30	17.0 117.0	30	105.0 0.0	17.0 113.1	40.0 109.0	5.0 17.0	109.0 44.0	44.0 5	17.0 109.0 44.0 44.0 5	17.0 106.1 44.0 100.0 0	10.0 17.0 106.1 44.0 100.0 0	17.0 106.1 44.0 100.0 0	17.0 106.1 44.0 100.0 0	
YCV004	14.0 115.0	30	14.4 115.0	30	42.0 0.0	14.0 110.0	40.0 216.0	0.0 14.0	109.0 44.0	44.0 5	14.0 109.0 44.0 44.0 5	14.0 106.0 44.0	10.0 14.0 106.0 44.0 0	14.0 106.0 44.0 0	14.0 106.0 44.0 0	
YCV124	14.0 115.0	35	15.2 115.0	35	8.0 0.0	15.0 110.0	30.0 131.0	10.0 15.0	106.0 44.0	44.0 5	15.0 106.0 44.0 44.0 5	15.0 130.0 44.0 10.0 0	10.0 15.0 106.0 44.0 44.0 5	15.0 130.0 44.0 10.0 0	15.0 106.0 44.0 44.0 5	
YCV184	14.0 114.0	35	15.3 114.7	35	6.0 0.0	15.7 110.0	30.0 129.0	0.0 14.0	106.0 44.0	44.0 5	14.0 106.0 44.0 44.0 5	14.0 130.0 44.0 10.0 0	10.0 14.0 106.0 44.0 44.0 5	15.0 130.0 44.0 10.0 0	15.0 106.0 44.0 44.0 5	
YCV004	14.0 113.0	35	15.5 113.5	35	19.0 0.0	16.0 109.1	30.0 109.0	0.0 14.0	109.0 44.0	44.0 5	14.0 109.0 44.0 44.0 5	14.0 106.0 44.0	10.0 14.0 106.0 44.0 0	14.0 106.0 44.0 0	14.0 106.0 44.0 0	
YCV004	14.0 112.0	40	16.2 112.0	40	6.0 0.0	18.1 104.1	50.0 49.0	5.0 14.0	104.1 44.0	44.0 5	14.0 104.1 44.0 44.0 5	14.0 101.0 44.0	10.0 14.0 101.0 44.0 0	14.0 101.0 44.0 0	14.0 101.0 44.0 0	
YCV124	17.1 112.1	40	17.1 111.9	40	11.0 0.0	19.0 108.7	35.0 85.0	-5.0 17.0	108.7 44.0	44.0 5	17.0 108.7 44.0 44.0 5	17.0 105.0 44.0	10.0 17.0 105.0 44.0 0	17.0 105.0 44.0 0	17.0 105.0 44.0 0	
YCV184	17.0 111.5	50	17.0 111.5	50	12.0 0.0	20.5 108.4	35.0 130.0	-5.0 17.0	108.4 44.0	44.0 5	17.0 108.4 44.0 44.0 5	17.0 105.0 44.0	10.0 17.0 105.0 44.0 0	17.0 105.0 44.0 0	17.0 105.0 44.0 0	
YCV004	18.0 110.0	50	18.1 111.1	50	18.0 0.0	20.7 104.1	35.0 191.0	-5.0 18.0	104.1 44.0	44.0 5	18.0 104.1 44.0 44.0 5	18.0 101.0 44.0	10.0 18.0 101.0 44.0 0	18.0 101.0 44.0 0	18.0 101.0 44.0 0	
YCV004	18.0 109.0	45	18.0 110.0	45	17.0 0.0	20.5 107.0	35.0 162.0	-5.0 18.0	107.0 44.0	44.0 5	18.0 107.0 44.0 44.0 5	18.0 104.0 44.0	10.0 18.0 104.0 44.0 0	18.0 104.0 44.0 0	18.0 104.0 44.0 0	
YCV124	18.0 109.0	40	18.3 108.0	40	13.0 0.0	19.0 104.0	30.0 140.0	10.0 18.0	104.0 44.0	44.0 5	18.0 104.0 44.0 44.0 5	18.0 101.0 44.0	10.0 18.0 101.0 44.0 0	18.0 101.0 44.0 0	18.0 101.0 44.0 0	
YCV184	18.0 108.3	40	18.0 107.0	40	6.0 0.0	19.0 104.0	30.0 140.0	10.0 18.0	104.0 44.0	44.0 5	18.0 104.0 44.0 44.0 5	18.0 101.0 44.0	10.0 18.0 101.0 44.0 0	18.0 101.0 44.0 0	18.0 101.0 44.0 0	
YCV004	18.0 107.5	40	18.3 107.0	40	19.0 0.0	19.0 104.0	30.0 140.0	10.0 18.0	104.0 44.0	44.0 5	18.0 104.0 44.0 44.0 5	18.0 101.0 44.0	10.0 18.0 101.0 44.0 0	18.0 101.0 44.0 0	18.0 101.0 44.0 0	
YCV004	17.0 106.0	40	18.3 106.0	40	32.0 0.0	18.0 104.0	30.0 140.0	10.0 18.0	104.0 44.0	44.0 5	18.0 104.0 44.0 44.0 5	18.0 101.0 44.0	10.0 18.0 101.0 44.0 0	18.0 101.0 44.0 0	18.0 101.0 44.0 0	
YCV124	17.7 106.0	35	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	-0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	

ALL FORECASTS

MMG 24-HR 48-HR 72-HR

AVG FORECAST POSIT ERNOR

32. 165. 231. 205.

AVG NIGHT ANGLE ERNOR

16. 86. 134. 210.

AVG INTENSITY MAGNITUDE ERNOR

0. 4. 6. 3.

AVG INTENSITY BIAS

0. 1. 2. -1.

NUMBER OF FORECASTS

21 18 10 7

TYPHOON LOLA

(September-October)

ALL FORECASTS

	MMR	24-MM	48-MH	72-MH
Avg Forecast Posit Error	13°	54°	112°	134°
Avg Height Angle Error	4°	40°	79°	88°
Avg Intensity Magnitude Error	1°	6°	6°	4°
Avg Intensity Bias	1°	3°	2°	-6°
Number of Forecasts	34	30	26	17

TYPHOONS WHILE OVER 35 KTS

WRNG	74-MM	40-MM	12-MM
13+	44+	114+	134+
+	44+	74+	84+
2+	5+	0+	9+
0+	3+	2+	-6+
	-	-	1

TYPHOON MAMIE

(September-October)

POSIT	WIND	DST	WIND	24 HOUR FORECAST				48 HOUR FORECAST				12 HOUR FORECAST			
				ERRHRS				ERRHRS				ERRHRS			
				POSI	WIND	DST	WIND	POSI	WIND	DST	WIND	POSI	WIND	DST	WIND
929002	19.1 154.2	29	0.0 0.0	0.	-0.	0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.	-0.
929002	19.0 153.9	25	0.0 0.0	0.	-0.	0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.	-0.
929122	19.9 153.3	25	0.0 0.0	0.	-0.	0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.	-0.
929122	19.8 152.9	25	0.0 0.0	0.	-0.	0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.	-0.
930002	19.4 152.6	30	0.0 0.0	0.	-0.	0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.	-0.
930002	19.3 152.3	35	19.3 152.4	30	51.	-5.	19.4 150.4	45.	185.	0.	2nd	147.7	50.	341.	-5.
930122	20.0 152.2	35	19.6 152.0	35	43.	0.	19.6 152.1	30.	225.	0.	2nd	149.6	60.	413.	0.
1001002	21.1 152.8	40	21.1 153.1	35	34.	-5.	23.7 151.9	20.	117.	0.	2nd	149.5	60.	474.	-5.
1001002	22.4 152.3	45	22.4 152.3	35	35.	0.	26.0 150.1	20.	38.	0.	2nd	149.4	55.	139.	-15.
1001122	23.4 151.8	50	23.5 151.9	30.	23.	-14.	26.4 150.4	20.	30.	0.	2nd	149.2	60.	234.	-10.
1001122	24.1 150.7	50	24.3 150.7	35	12.	-5.	27.5 149.1	00.	125.	0.	2nd	149.2	60.	33.3 151.3	0.
1002002	24.9 150.2	50	24.7 150.0	30.	16.	0.	27.4 147.8	00.	148.	0.	2nd	148.6	60.	722.	15.
1002002	25.4 150.1	55	25.8 149.8	30.	12.	-5.	29.2 144.8	00.	169.	0.	2nd	151.1	60.	584.	5.
1002122	26.9 150.3	60	26.8 150.3	30.	12.	-10.	30.0 151.0	00.	180.	0.	2nd	150.4	60.	231.	15.
1002122	26.0 150.3	65	27.2 150.7	30.	24.	-15.	31.7 152.8	00.	213.	0.	2nd	150.0	60.	0.	-0.
1003002	27.0 150.8	70	28.7 150.7	30.	24.	-15.	32.4 153.4	00.	326.	0.	2nd	150.0	60.	0.	-0.
1003002	30.1 151.0	70	31.7 153.0	30.	24.	0.	34.6 156.0	00.	326.	0.	2nd	150.0	60.	0.	-0.
1003122	32.3 152.9	70	31.7 153.0	35	36.	-5.	36.9 161.0	00.	259.	0.	2nd	150.0	60.	0.	-0.
1003122	34.1 155.1	65	34.7 155.0	35	5.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-0.
1004002	36.0 157.7	60	36.4 157.8	50.	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-0.
1004002	38.1 160.4	55	38.6 160.2	55.	11.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-0.
1004122	40.0 163.2	45	40.2 163.1	40.	36.	-5.	0.	0.	0.	0.	0.	0.	0.	0.	0.

WIND	ALL FORECASTS			TYPHOONS WHILE OVER 35 KTS		
	24-HR	48-HR	72-HR	WIND	24-HR	48-HR
AVG FORECAST POSIT FPHR	25.	182.	386.	25.	142.	386.
AVG HIGH ANGLE ERHRS	14.	68.	143.	321.	14.	68.
AVG INTENSITY MAGNITUDE ERHRS	5.	4.	8.	5.	4.	8.
AVG INTENSITY BIAS	-5.	-4.	-3.	1.	-4.	-3.
NUMBER OF FORECASTS	18	14	10	6	18	14

TROPICAL STORM NINA

(October)

ALL FORECAST

HRNG	24-HR	48-HR	72-HR
19.	120.	240.	340.
16.	94.	212.	340.
2.	5.	10.	10.
-0.	3.	5.	5.

TYPHOON ORA

(October)

BEST TRACK				WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST							
POSIT		WIND		ERRORS		POSIT		WIND		ERRORS		POSIT		WIND		ERRORS		POSIT		WIND			
100000Z	11.3	128.0	29	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.		
100006Z	12.1	128.9	29	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.		
100012Z	12.8	128.7	29	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.		
100018Z	13.0	128.6	29	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.		
100024Z	14.9	127.9	28	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.		
100030Z	14.9	126.6	28	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.		
100036Z	14.9	124.7	30	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.		
100042Z	17.4	123.9	35	17.2	123.9	35	0.	20.7	131.4	30	11.0	0.	24.5	130.1	35	34.7	0.	27.9	132.3	35	54.4	10.	
100048Z	17.6	123.9	36	17.7	123.9	36	0.	21.1	130.4	30	10.0	0.	24.2	129.9	35	36.4	0.	24.3	131.4	35	54.4	10.	
100054Z	17.7	121.5	40	18.9	121.5	40	7.0	0.	22.0	129.0	30	12.0	0.	24.4	128.0	35	34.6	0.	24.9	131.5	35	54.7	10.
100100Z	19.6	130.5	45	18.5	130.1	40	21.	0.	21.0	126.4	30	3.0	0.	24.5	122.1	35	12.3	-10.	26.6	117.6	30	3.0	-10.
100106Z	19.5	129.6	45	19.3	129.1	40	21.	-10.	22.0	125.0	30	0.	0.	24.4	120.9	35	10.0	-30.	26.8	119.5	35	3.0	-30.
100112Z	20.1	128.7	50	20.1	128.7	50	0.	0.	22.0	125.0	30	9.0	0.	24.8	121.3	35	10.2	-30.	26.0	117.0	35	3.0	-30.
100118Z	20.9	127.4	55	21.1	127.5	50	4.	-5.	23.0	121.7	35	10.0	0.	24.2	120.7	35	13.1	-35.	0.0	0.0	0.	-0.	
100124Z	21.2	125.5	60	21.2	125.5	55	12.	-5.	22.0	126.0	30	10.0	0.	24.4	119.9	35	10.0	-20.	0.0	0.0	0.	-0.	
100130Z	21.6	123.6	65	22.0	123.7	60	20.	-2.	23.2	117.6	30	22.0	0.	24.5	113.6	25	57.3	-30.	0.0	0.0	0.	-0.	
100136Z	22.1	123.6	70	22.3	123.1	65	13.	-5.	23.0	118.0	30	20.0	0.	24.4	113.0	25	57.3	-30.	0.0	0.0	0.	-0.	
100142Z	22.5	122.7	70	22.5	122.9	70	24.	0.	23.2	118.0	30	22.0	0.	24.5	112.0	25	57.3	-30.	0.0	0.0	0.	-0.	
100148Z	22.5	122.6	75	22.5	122.6	75	35.	-5.	22.7	119.0	35	20.0	0.	24.5	118.7	35	10.7	-10.	0.0	0.0	0.	-0.	
100154Z	23.1	122.1	80	23.0	123.0	70	18.	-10.	26.0	125.0	30	4.0	0.	24.8	126.9	35	8.0	-20.	0.0	0.0	0.	-0.	
100156Z	23.1	122.9	85	23.1	122.7	80	12.	-5.	27.2	124.3	35	3.0	0.	24.0	125.0	30	0.0	-20.	0.0	0.0	0.	-0.	
100158Z	23.1	123.1	80	23.1	123.1	80	18.	0.	27.7	125.0	35	2.0	0.	24.0	126.0	30	0.0	-20.	0.0	0.0	0.	-0.	
101004Z	23.5	123.2	85	25.5	123.0	80	0.	0.	28.2	121.0	30	10.	0.	24.0	121.0	30	0.0	-20.	0.0	0.0	0.	-0.	
101006Z	24.0	123.6	85	26.2	123.1	80	13.	-5.	26.0	121.0	30	12.0	0.	24.0	120.0	30	0.0	-20.	0.0	0.0	0.	-0.	
101012Z	27.3	126.0	80	27.1	126.0	80	12.	0.	0.0	0.0	0.	-0.	0.	0.	0.0	0.	-0.	0.0	0.0	0.	-0.		
101018Z	28.2	128.0	85	28.0	127.5	80	24.	-5.	0.0	0.0	0.	-0.	0.	0.	0.0	0.	-0.	0.0	0.0	0.	-0.		
101024Z	29.5	120.3	35	29.3	120.4	35	29.	0.	0.0	0.0	0.	-0.	0.	0.	0.0	0.	-0.	0.0	0.0	0.	-0.		

ALL FORECASTS

WIND	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	19.	124.	316.
AVG HIGH ANGLE ERROR	14.	99.	239.
AVG INTENSITY MAGNITUDE ERROR	4.	15.	19.
AVG INTENSITY BIAS	+1.	-1.	-15.
NUMBER OF FORECASTS	21	17	6

TYPHOONS WHILE OVER 35 KTS

WIND	24-HR	48-HR	72-HR
AVG FORECAST POSIT ERROR	19.	126.	319.
AVG HIGH ANGLE ERROR	14.	94.	237.
AVG INTENSITY MAGNITUDE ERROR	4.	15.	19.
AVG INTENSITY BIAS	0.	-1.	-15.
NUMBER OF FORECASTS	21	17	11

TROPICAL DEPRESSION 26

(October)

BEST TRACK				WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST					
POSIT		WIND		ERRORS		POSIT		WIND		ERRORS		POSIT		WIND		ERRORS		POSIT		WIND	
100018Z	19.3	163.7	29	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100024Z	19.7	163.0	29	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100030Z	20.5	162.6	29	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100036Z	21.1	162.3	29	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100042Z	21.5	162.0	25	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100048Z	21.9	161.0	25	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100100Z	22.1	161.2	25	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100106Z	22.1	161.2	25	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100112Z	22.1	160.7	25	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100118Z	22.1	159.9	25	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.	0.0	0.0	0.0	0.0	0.	-0.	0.0	0.0	0.	-0.
100124Z	22.2	158.0	25	22.2	158.4	25	25.	0.	22.9	154.5	35	11.5	0.	0.0	0.	0.	0.	0.	0.	0.	0.
100130Z	22.0	157.7	25	22.0	159.0	25	78.	0.	22.5	154.5	35	30.2	0.	0.0	0.	0.	0.	0.	0.	0.	0.
100136Z	22.1	156.1	25	22.1	157.7	25	94.	0.	22.5	154.5	35	29.8	10.	0.0	0.0	0.	0.	0.	0.	0.	0.
100142Z	22.0	154.4	25	22.2	155.1	25	45.	0.	23.6	151.2	35	15.5	1%	0.0	0.0	0.	0.	0.	0.	0.	0.
100148Z	23.4	152.6	30	23.5	152.5	30	80.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.	0.
100154Z	23.7	151.1	30	24.1	151.0	30	25.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.	0.
100156Z	24.2	149.8	25	24.1	149.4	25	6.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.	0.
100158Z	24.8	148.7	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.	0.

ALL FORECASTS

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TROPICAL DEPRESSION 27

(October)

HGT/ TRACK	WARNING				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
	ERRMOS				ERRMOS				ERRMOS				ERRMOS			
	POSLT	WIND	POSLT	WIND	POSLT	WIND	POSLT	WIND	POSLT	WIND	POSLT	WIND	POSLT	WIND	POSLT	WIND
1010002	5.0 153.4	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1010002	0.0 152.7	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1010122	0.0 151.3	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1010182	0.0 150.9	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1011002	7.3 149.9	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1011062	7.3 149.4	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1011122	8.2 147.9	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1011182	8.2 146.8	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1012002	8.7 145.7	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1012062	9.0 144.6	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1012122	9.0 142.6	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1012182	9.7 140.7	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1013002	10.0 139.1	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1013062	10.4 137.1	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1013122	11.0 136.4	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1013182	11.0 135.1	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1014002	12.1 136.5	20	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1014062	12.0 133.5	20	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1014122	13.0 132.6	20	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1014182	13.7 131.8	20	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1015002	14.1 131.1	20	14.3 131.0	20	13.0 0.	16.5 127.8	30. 131.	10. 0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1015062	14.8 130.4	20	14.8 130.2	20	17.0 0.	17.1 127.0	30. 128.	15. 0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1015122	15.0 130.2	20	15.3 129.1	20	15.5 0.	17.5 126.5	30. 202.	15. 0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1015182	15.9 130.1	20	15.9 128.7	20	16.4 0.	0.0 0.0	0.0 0.0	0.0 0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1016002	16.9 130.1	20	16.3 129.4	20	16.7 0.	0.0 0.0	0.0 0.0	0.0 0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1016062	16.5 130.1	15	16.5 130.0	15	13.0 0.	0.0 0.0	0.0 0.0	0.0 0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1016122	16.7 130.0	15	0.0 0.0	0.0 -0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0

ALL FORECASTS
WIND 24-HR 48-HR 72-HR

Avg Forecast Posit Erron 175. 0. 0.
Avg Height Angle Erron 168. 0. 0.
Avg Intensity Magnitude Erron 13. 0. 0.
Avg Intensity HtAs 13. 0. 0.
Number of Forecasts 6 3 0

TYphoon Phyllis

(October) LINE FOR 33.3 REDUCTION

BEST TRACK				WARNING ERRORS				24 HOUR FORECAST				48 HOUR FORECAST				72 HOUR FORECAST			
POSIT	WIND	PSIT	WIND	DST	WIND	PSIT	WIND	PSIT	WIND	PSIT	WIND	DST	WIND	PSIT	WIND	PSIT	WIND		
1015122	10.0 165.5	15	0.0 0.0	0.	0.	0.0 0.0	0.	-0.0	0.0 0.0	0.0 0.0	0.	-0.0	0.0 0.0	0.	0.0 0.0	0.	-0.0 0.0		
1015182	0.0 165.0	15	0.0 0.0	0.	0.	0.0 0.0	0.	-0.0	0.0 0.0	0.0 0.0	0.	-0.0	0.0 0.0	0.	0.0 0.0	0.	-0.0 0.0		
1014002	9.5 164.5	15	0.0 0.0	0.	0.	0.0 0.0	0.	-0.0	0.0 0.0	0.0 0.0	0.	-0.0	0.0 0.0	0.	0.0 0.0	0.	-0.0 0.0		
1014062	10.5 164.1	15	0.0 0.0	0.	0.	0.0 0.0	0.	-0.0	0.0 0.0	0.0 0.0	0.	-0.0	0.0 0.0	0.	0.0 0.0	0.	-0.0 0.0		
1014122	11.0 163.7	15	0.0 0.0	0.	0.	0.0 0.0	0.	-0.0	0.0 0.0	0.0 0.0	0.	-0.0	0.0 0.0	0.	0.0 0.0	0.	-0.0 0.0		
1014182	12.0 163.2	15	0.0 0.0	0.	0.	0.0 0.0	0.	-0.0	0.0 0.0	0.0 0.0	0.	-0.0	0.0 0.0	0.	0.0 0.0	0.	-0.0 0.0		
1015002	13.0 162.0	20	0.0 0.0	0.	0.	0.0 0.0	0.	-0.0	0.0 0.0	0.0 0.0	0.	-0.0	0.0 0.0	0.	0.0 0.0	0.	-0.0 0.0		
1015062	14.0 162.2	20	0.0 0.0	0.	0.	0.0 0.0	0.	-0.0	0.0 0.0	0.0 0.0	0.	-0.0	0.0 0.0	0.	0.0 0.0	0.	-0.0 0.0		
1015122	14.5 161.5	25	14.7 161.5	25	13.0 0.	17.2 158.4	30	17.2 158.4	30	18.8 154.5	40	18.8 157.5	45	19.8 150.5	45	19.8 150.5	45	27.7 45	
1015182	15.0 161.2	25	14.9 161.1	25	8.0 0.	17.1 158.3	30	17.1 158.3	30	18.8 154.9	40	18.8 154.9	40	18.8 150.5	45	19.8 150.5	45	287.45	
1016002	15.0 160.7	30	15.6 160.0	30	6.0 0.	17.5 158.2	35	17.5 158.2	35	19.4 154.8	40	19.4 154.8	40	19.4 150.7	45	19.4 150.7	45	285.50	
1016062	16.0 159.2	40	16.2 159.4	40	12.0 0.	18.3 157.9	30	18.3 157.9	30	19.0 154.6	40	19.0 154.6	40	19.0 150.3	40	19.0 150.3	40	312.30	
1016122	16.2 159.7	40	15.7 159.5	40	32.0 0.	17.8 156.9	30	17.8 156.9	30	19.0 154.0	40	19.0 154.0	40	19.1 148.7	40	19.1 148.7	40	448.35	
1016182	16.5 159.1	45	16.4 159.2	45	6.0 0.	17.5 156.5	30	17.5 156.5	30	19.7 153.5	45	19.7 153.5	45	19.1 149.3	45	19.1 149.3	45	428.25	
1017002	16.9 158.5	50	16.8 158.5	50	6.0 0.	17.9 156.0	30	17.9 156.0	30	19.0 152.8	50	19.0 152.8	50	19.6 148.6	50	19.6 148.6	50	441.20	
1017062	17.0 157.9	55	17.3 157.4	55	12.0 0.	18.8 155.5	55	18.8 155.5	55	19.0 152.0	50	19.0 152.0	50	19.7 147.8	50	19.7 147.8	50	437.15	
1017122	18.0 157.2	55	18.0 156.6	55	26.0 0.	19.7 153.6	55	19.7 153.6	55	20.6 149.5	50	20.6 149.5	50	20.7 145.2	50	20.7 145.2	50	569.10	
1017182	19.0 156.4	65	18.8 156.4	65	19.0 0.	20.5 152.4	50	20.5 152.4	50	20.6 149.2	50	20.6 149.2	50	20.6 143.9	50	20.6 143.9	50	639.0	
1018002	19.0 155.6	70	19.7 155.6	70	6.0 0.	21.5 152.4	50	21.5 152.4	50	21.4 147.8	50	21.4 147.8	50	22.0 143.2	50	22.0 143.2	50	637.5	
1018062	20.0 155.3	85	20.3 155.3	85	0.0 0.	23.6 154.9	50	23.6 154.9	50	20.0 156.9	50	20.0 156.9	50	24.3 161.2	50	24.3 161.2	50	406.10	
1018122	20.0 155.3	90	21.1 155.3	90	12.0 0.	24.7 155.9	50	24.7 155.9	50	24.0 159.6	50	24.0 159.6	50	30.4 165.5	50	30.4 165.5	50	554.5	
1018182	21.5 155.3	90	21.6 155.3	90	6.0 0.	25.0 156.0	50	25.0 156.0	50	24.2 159.9	50	24.2 159.9	50	30.5 166.0	50	30.5 166.0	50	452.5	
1019002	22.0 155.4	95	22.1 155.4	95	0.0 0.	25.1 156.7	55	25.1 156.7	55	27.8 160.5	50	27.8 160.5	50	29.4 166.6	50	29.4 166.6	50	375.10	
1019062	22.0 155.5	95	22.7 155.5	95	6.0 0.	25.5 157.0	55	25.5 157.0	55	28.0 160.9	50	28.0 160.9	50	30.5 168.0	50	30.5 168.0	50	406.0	
1019122	23.0 155.5	95	23.1 155.7	95	11.0 0.	25.7 157.3	55	25.7 157.3	55	28.2 161.2	50	28.2 161.2	50	33.5 170.0	50	33.5 170.0	50	0.0	
1019182	23.0 155.9	95	23.7 155.9	95	33.0 0.	26.4 158.1	55	26.4 158.1	55	28.7 163.0	50	28.7 163.0	50	32.4 174.0	50	32.4 174.0	50	0.0	
1020002	24.0 154.9	90	24.3 155.5	90	35.0 0.	27.6 156.4	55	27.6 156.4	55	29.8 161.2	50	29.8 161.2	50	30.0 189.0	50	30.0 189.0	50	0.0	
1020062	24.0 154.8	85	24.6 154.8	85	5.0 0.	27.6 152.9	55	27.6 152.9	55	31.0 157.4	50	31.0 157.4	50	30.0 189.0	50	30.0 189.0	50	0.0	
1020122	25.0 154.2	80	25.5 154.2	80	6.0 0.	29.3 154.5	70	29.3 154.5	70	30.0 162.0	50	30.0 162.0	50	30.0 189.0	50	30.0 189.0	50	0.0	
1020182	26.1 153.9	80	26.0 154.0	80	8.0 0.	29.8 154.6	65	29.8 154.6	65	30.0 164.0	50	30.0 164.0	50	30.0 189.0	50	30.0 189.0	50	0.0	
1021002	27.1 153.5	80	27.0 153.5	80	6.0 0.	31.0 154.0	60	31.0 154.0	60	30.0 164.0	50	30.0 164.0	50	30.0 189.0	50	30.0 189.0	50	0.0	
1021062	28.0 153.0	75	28.4 152.6	75	5.0 0.	33.4 154.8	55	33.4 154.8	55	30.0 164.0	50	30.0 164.0	50	30.0 189.0	50	30.0 189.0	50	0.0	
1021122	29.0 153.0	70	29.8 153.0	70	62.0 0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0	
1021182	30.0 157.2	65	29.6 155.8	65	98.0 0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0	
1022002	32.0 160.5	60	31.4 158.0	60	124.0 0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0	
1022062	35.0 164.0	50	35.5 164.1	50	8.0 0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0 0.0	0.	0.0	

ALL FORECASTS

WIND 24-HR 48-HR 72-HR

AVG FORECAST POSIT ERROR 22.0 132.0 263.0 436.0

AVG NIGHT ANGLE ERROR 13.0 86.0 198.0 377.0

AVG INTENSITY MAGNITUDE ERROR 0.0 7.0 16.0 21.0

AVG INTENSITY BIAS 0.0 -6.0 -14.0 -18.0

NUMBER OF FORECASTS 28 24 20 15

TYPHONS WHILE OVER 35 KTS

WIND 24-HR 48-HR 72-HR

AVG FORECAST POSIT ERROR 24.0 132.0 263.0 436.0

AVG NIGHT ANGLE ERROR 14.0 86.0 198.0 377.0

AVG INTENSITY MAGNITUDE ERROR 0.0 7.0 16.0 21.0

AVG INTENSITY BIAS 0.0 -6.0 -14.0 -18.0

NUMBER OF FORECASTS 25 24 20 15

SUPER TYPHOON RITA

(October)

BEST TRACK	WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST		
	POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND
101500Z	10°.0	125°+	15	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101500Z	9°.7	124°+	15	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101512Z	9°.3	123°+	15	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101518Z	9°.2	122°+	20	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101600Z	9°.1	121°+	25	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101606Z	9°.0	120°+	25	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101612Z	8°.9	119°+	25	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101618Z	8°.1	119°+	30	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101700Z	8°.2	118°+	30	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101706Z	8°.7	117°+	30	0°.0	0°.0	0.	-70°	0°.	0°.0	0°.0	0.0	0°.0
101712Z	8°.9	116°+	30	10°.1	176°+	30	0°.	10°.0	10°.0	10°.	10°.0	10°.0
101718Z	10°.2	175°+	30	10°.2	175°+	30	0°.	11°.0	174°+	30	11°.0	174°+
101800Z	10°.2	174°+	30	10°.2	174°+	30	0°.	11°.1	173°+	30	10°.2	173°+
101806Z	10°.1	173°+	35	10°.7	173°+	35	0°.	11°.6	169°+	35	10°.7	169°+
101812Z	10°.1	172°+	35	10°.9	172°+	35	0°.	11°.8	168°+	35	10°.9	168°+
101818Z	10°.9	171°+	35	11°.0	171°+	35	0°.	11°.9	167°+	35	11°.0	167°+
101900Z	11°.1	170°+	40	11°.0	170°+	40	0°.	11°.2	166°+	40	11°.1	166°+
101906Z	11°.3	168°+	40	11°.3	168°+	40	0°.	11°.4	166°+	40	11°.3	166°+
101912Z	11°.3	167°+	45	11°.2	167°+	45	0°.	12°.1	163°+	45	11°.2	163°+
101918Z	11°.3	165°+	45	11°.5	166°+	45	0°.	12°.3	161°+	45	11°.5	161°+
102000Z	11°.6	164°+	75	11°.7	164°+	75	0°.	12°.5	158°+	75	11°.6	158°+
102006Z	11°.6	162°+	75	11°.7	162°+	75	0°.	12°.6	157°+	75	11°.6	156°+
102012Z	11°.7	161°+	80	11°.8	161°+	75	0°.	12°.8	155°+	80	11°.7	155°+
102018Z	11°.7	159°+	80	11°.8	159°+	80	0°.	12°.7	153°+	80	11°.7	153°+
102100Z	11°.9	158°+	85	11°.9	158°+	85	0°.	11°.7	159°+	85	11°.9	158°+
102106Z	11°.9	156°+	85	11°.8	156°+	85	0°.	12°.0	151°+	85	11°.9	155°+
102112Z	11°.8	156°+	85	11°.8	156°+	85	0°.	12°.1	151°+	85	11°.8	156°+
102118Z	11°.8	155°+	85	11°.8	155°+	85	0°.	12°.3	149°+	85	11°.8	155°+
102200Z	11°.2	153°+	115	11°.1	153°+	110	0°.	11°.5	159°+	85	11°.2	152°+
102206Z	11°.2	152°+	115	11°.2	152°+	115	0°.	12°.0	157°+	85	11°.2	156°+
102212Z	11°.2	151°+	125	11°.3	152°+	120	0°.	12°.1	157°+	85	11°.2	156°+
102218Z	11°.2	151°+	130	11°.3	151°+	125	0°.	12°.2	157°+	85	11°.2	156°+
102300Z	11°.9	149°+	105	11°.2	150°+	95	0°.	11°.7	159°+	85	11°.9	149°+
102306Z	11°.9	148°+	105	11°.2	150°+	95	0°.	11°.7	159°+	85	11°.9	149°+
102312Z	11°.9	147°+	105	11°.2	150°+	95	0°.	12°.3	149°+	85	11°.9	147°+
102318Z	11°.1	147°+	110	11°.1	148°+	105	0°.	12°.5	149°+	85	11°.1	147°+
102400Z	11°.1	145°+	115	11°.1	145°+	110	0°.	12°.5	149°+	85	11°.1	145°+
102406Z	11°.1	143°+	115	11°.1	143°+	115	0°.	12°.5	149°+	85	11°.1	143°+
102412Z	11°.1	142°+	125	11°.2	142°+	120	0°.	12°.6	147°+	85	11°.1	142°+
102418Z	11°.1	141°+	130	11°.2	141°+	125	0°.	12°.7	147°+	85	11°.1	141°+
102500Z	11°.9	140°+	140	11°.7	140°+	130	0°.	12°.8	146°+	85	11°.9	140°+
102506Z	11°.9	139°+	145	11°.6	140°+	135	0°.	12°.9	146°+	85	11°.9	139°+
102512Z	11°.9	138°+	145	11°.6	138°+	145	0°.	12°.9	146°+	85	11°.9	138°+
102518Z	11°.7	137°+	150	11°.7	137°+	140	0°.	12°.9	146°+	85	11°.7	137°+
102600Z	11°.7	136°+	155	11°.6	136°+	145	0°.	12°.9	146°+	85	11°.7	136°+
102606Z	11°.7	135°+	155	11°.6	135°+	145	0°.	12°.9	146°+	85	11°.7	135°+
102612Z	11°.7	134°+	155	11°.6	134°+	145	0°.	12°.9	146°+	85	11°.7	134°+
102618Z	11°.7	133°+	155	11°.6	133°+	145	0°.	12°.9	146°+	85	11°.7	133°+
102700Z	12°.9	131°+	155	12°.9	131°+	145	0°.	13°.0	122°+	100	12°.9	131°+
102706Z	12°.9	130°+	155	12°.9	130°+	145	0°.	13°.1	120°+	105	12°.9	130°+
102712Z	12°.9	129°+	155	12°.9	129°+	145	0°.	13°.1	120°+	105	12°.9	129°+
102718Z	12°.9	128°+	155	12°.9	128°+	145	0°.	13°.1	120°+	105	12°.9	128°+
102800Z	12°.9	127°+	155	12°.9	127°+	145	0°.	13°.1	120°+	105	12°.9	127°+
102806Z	12°.9	126°+	155	12°.9	126°+	145	0°.	13°.1	120°+	105	12°.9	126°+
102812Z	12°.9	125°+	155	12°.9	125°+	145	0°.	13°.1	120°+	105	12°.9	125°+
102818Z	12°.9	124°+	155	12°.9	124°+	145	0°.	13°.1	120°+	105	12°.9	124°+
102900Z	12°.9	123°+	155	12°.9	123°+	145	0°.	13°.1	120°+	105	12°.9	123°+
102906Z	12°.9	122°+	155	12°.9	122°+	145	0°.	13°.1	120°+	105	12°.9	122°+
102912Z	12°.9	121°+	155	12°.9	121°+	145	0°.	13°.1	120°+	105	12°.9	121°+
102918Z	12°.9	120°+	155	12°.9	120°+	145	0°.	13°.1	120°+	105	12°.9	120°+
103000Z	12°.9	119°+	155	12°.9	119°+	145	0°.	13°.1	120°+	105	12°.9	119°+
103006Z	12°.9	118°+	155	12°.9	118°+	145	0°.	13°.1	120°+	105	12°.9	118°+
103012Z	12°.9	117°+	155	12°.9	117°+	145	0°.	13°.1	120°+	105	12°.9	117°+
103018Z	12°.9	116°+	155	12°.9	116°+	145	0°.	13°.1	120°+	105	12°.9	116°+
103100Z	12°.9	115°+	155	12°.9	115°+	145	0°.	13°.1	120°+	105	12°.9	115°+
103106Z	12°.9	114°+	155	12°.9	114°+	145	0°.	13°.1	120°+	105	12°.9	114°+
103112Z	12°.9	113°+	155	12°.9	113°+	145	0°.	13°.1	120°+	105	12°.9	113°+
103118Z	12°.9	112°+	155	12°.9	112°+	145	0°.	13°.1	120°+	105	12°.9	112°+
103200Z	12°.9	111°+	155	12°.9	111°+	145	0°.	13°.1	120°+	105	12°.9	111°+
103206Z	12°.9	110°+	155	12°.9	110°+	145	0°.	13°.1	120°+	105	12°.9	110°+
103212Z	12°.9	109°+	155	12°.9	109°+	145	0°.	13°.1	120°+	105	12°.9	109°+
103218Z	12°.9	108°+	155	12°.9	108°+	145	0°.	13°.1	120°+	105	12°.9	108°+
103300Z	12°.9	107°+	155	12°.9	107°+	145	0°.	13°.1	120°+	105	12°.9	107°+
103306Z	12°.9	106°+	155	12°.9	106°+	145	0°.	13°.1	120°+	105	12°.9	106°+
103312Z	12°.9	105°+	155	12°.9	105°+	145	0°.	13°.1	120°+	105	12°.9	105°+
103318Z	12°.9	104°+	155	12°.9	104°+	145	0°.	13°.1	120°+	105	12°.9	104°+
103400Z	12°.9	103°+	155	12°.9	103°+	145	0°.	13°.1	120°+	105	12°.9	103°+
103406Z	12°.9	102°+	155	12°.9	102°+	145	0°.	13°.1	120°+	105	12°.9	102°+
103412Z	12°.9	101°+	155	12°.9	101°+	145	0°.	13°.1	120°+	105	12°.9	101°+
103418Z	12°.9	100°+	155	12°.9	100°+	145	0°.	13°.1	120°+	105	12°.9	100°+
103500Z	12°.9	99°+	155	12°.9	99°+	145	0°.	13°.1	120°+	105	12°.9	99°+
103506Z	12°.9	98°+	155	12°.9	98°+	145	0°.	13°.1	120°+	105	12°.9	98°+
103512Z	12°.9	97°+	155	12°.9	97°+	145	0°.	13°.1	120°+	105	12°.9	97°+
103518Z	12°.9	96°+	155	12°.9	96°+	145	0°.	13°.1	120°+	105	12°.9	96°+
103600Z	12°.9	95°+	155	12°.9	95°+	145	0°.	13°.1	120°+	105	12°.9	95°+
103606Z	12°.9	94°+	155	12°.9	94°+	145	0°.	13°.1	120°+	105	12°.9	94°+
103612Z	12°.9	93°+	155	12°.9	93°+	145	0°.	13°.1	120°+	105	12°.9	93°+
103618Z	12°.9	92°+	155	12°.9	92°+	145	0°.	13°.1	120°+	105	12°.9	92°+
103700Z	12°.9	91°+	155	12°								

TROPICAL STORM TESS

(November)

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST							
POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DSI	WIND	POSIT	WIND	DSI	WIND	POSIT	WIND	DSI	WIND		
1101002	13.8 147.5	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.	0.0	0.	0.	0.		
1101002	13.9 146.8	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.	0.0	0.	0.	0.		
1101122	14.0 146.4	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.	0.0	0.	0.	0.		
1101102	14.1 146.0	20	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.	0.0	0.	0.	0.		
1101002	14.0 145.6	20	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.	0.0	0.	0.	0.		
1101002	14.0 145.2	20	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.	0.0	0.	0.	0.		
1101122	14.0 144.8	25	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.	0.0	0.	0.	0.		
1101002	14.2 144.5	25	15.4 142.7	25	104.0	0.	15.0	140.7	0.	107.5	138.2	0.	107.5	0.	14.8 135.5	0.	72.5	0.	
1100002	14.9 144.2	30	15.5 144.2	30	24.0	0.	16.0	141.3	0.	19.1	0.	17.5	140.8	0.	20.5	138.7	0.	63.8	0.
1100002	14.6 144.4	30	16.4 144.3	30	33.0	0.	18.0	141.7	0.	13.5	0.	21.1	143.4	0.	25.8	143.8	0.	32.4	0.
1100122	17.0 144.6	30	17.4 144.1	30	31.0	0.	19.0	144.1	0.	12.5	0.	22.5	144.2	0.	17.4	145.7	0.	26.2	0.
1100102	14.9 145.0	35	18.6 145.0	30	12.5	-5.	21.3	145.8	0.	0.0	10.0	24.5	146.0	0.	27.7	151.7	0.	100	0.
1100002	14.9 145.0	40	18.8 145.1	35	33.0	-5.	21.0	146.0	0.	21.5	10.0	24.0	146.1	0.	26.0	151.0	0.	24.1	-5.
1100002	14.0 146.0	45	19.0 145.8	35	16.0	0.	21.1	146.5	35	33.0	0.	24.0	146.3	0.	27.0	151.2	0.	32.5	15.
1100122	14.5 146.3	45	19.0 146.3	35	6.0	0.	22.3	144.2	35	0.0	24.5	150.9	0.	17.0	5	24.3 154.3	0.	31.0	15.
1100102	20.3 146.4	50	14.9 146.8	30	33.0	0.	21.7	144.5	35	15.0	0.	20.5	150.5	0.	10.0	0.	0.	0.	
1100002	21.2 146.5	55	21.3 146.8	35	18.0	0.	25.5	140.8	35	30.0	0.	30.0	152.6	0.	47.0	10.	0.	0.	
1100002	22.1 146.5	55	22.0 147.0	35	56.0	0.	26.1	146.4	35	4.0	0.	30.0	153.2	0.	98.0	10.	0.	0.	
1100122	23.1 147.3	60	23.0 147.0	35	18.0	-5.	27.1	144.6	35	0.0	31.0	154.3	0.	16.0	15.	0.	0.	0.	
1100102	24.0 147.7	60	24.2 147.7	30	0.0	0.	28.0	150.9	0.	0.0	0.	0.0	0.	0.	0.0	0.	0.	0.	
1100002	25.4 148.1	60	25.4 148.4	30	16.0	0.	29.3	151.7	0.	0.0	0.	0.0	0.	0.	0.0	0.	0.	0.	
1100002	26.0 148.6	60	26.7 148.7	30	8.0	0.	31.0	151.8	35	12.0	-5.	0.0	0.	0.	0.0	0.	0.	0.	
1100122	28.1 149.7	60	27.9 149.2	30	39.0	0.	31.7	153.0	35	21.0	0.	0.0	0.	0.	0.0	0.	0.	0.	
1100102	29.9 151.1	60	28.8 150.7	30	41.0	0.	0.0	0.	0.	-0.0	0.	0.0	0.	0.	0.0	0.	0.	0.	
1100002	30.7 152.2	60	30.3 152.5	35	28.0	-5.	0.0	0.	0.	-0.0	0.	0.0	0.	0.	0.0	0.	0.	0.	
1100002	31.9 153.9	60	32.3 154.4	35	35.0	-5.	0.0	0.0	0.	-0.0	0.	0.0	0.	0.	0.0	0.	0.	0.	
1100122	33.1 156.4	55	33.5 157.1	30	26.0	-5.	0.0	0.0	0.	-0.0	0.	0.0	0.	0.	0.0	0.	0.	0.	

ALL FORECASTS																		
WNRG	24-HR	48-HR	72-HR	WNRG	24-HR	48-HR	72-HR	WNRG	24-HR	48-HR	72-HR	WNRG	24-HR	48-HR	72-HR	WNRG	24-HR	48-HR
Avg Forecast Posit Error	79.	108.	146.	367.														
Avg High/Low Angle Error	71.	53.	127.	237.														
Avg Intensity Magnitude Error	2.	4.	8.	4.														
Avg Intensity Bias	-2.	-1.	1.	3.														
Number of Forecasts	20	16	12	8														

TROPICAL DEPRESSION 32

(November)

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST						
POSIT	WIND	POSIT	WIND	ERROS	POSIT	WIND	DSI	WIND	POSIT	WIND	DSI	WIND	POSIT	WIND	DSI	WIND		
1115102	15.3 130.1	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.	0.	
1110002	15.3 129.8	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.	0.	
1110002	15.3 129.5	20	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.	0.	
1110122	15.3 129.2	20	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.	0.	
1101002	15.3 128.9	20	0.0	0.0	0.	-0.	0.	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.	0.	
1101002	15.3 128.4	25	16.0 130.0	25	96.0	0.	17.1	130.4	30	21.0	0.	19.5	132.9	35	53.0	10.	21.4 138.2	35.973
1110002	15.3 128.2	25	16.3 130.0	25	119.0	0.	17.3	130.4	30	24.9	0.	19.5	132.8	35.	55.0	15.	0.0	0.
1111002	15.2 128.0	25	17.0 128.9	25	119.0	0.	18.5	127.4	30	24.0	0.	20.0	125.2	35.	39.0	15.	0.0	0.
1111002	15.1 127.6	25	17.4 128.6	25	149.0	0.	19.1	126.4	30	29.0	0.	21.1	126.9	35.	49.1	15.	0.0	0.
1110002	15.0 127.3	25	14.6 126.8	25	37.0	0.	14.5	125.5	30	38.0	-5.	14.0	123.5	15.	38.0	0.	0.0	0.
1110002	14.7 126.8	25	14.6 126.8	25	6.0	0.	14.4	125.4	30	42.0	0.	0.0	0.	0.	0.	0.0	0.	0.
1110002	14.6 126.5	25	14.6 126.8	25	21.0	0.	14.3	124.6	30	48.0	0.	0.0	0.	0.	0.	0.0	0.	0.
1110002	14.2 126.1	25	14.6 126.4	25	21.0	0.	14.0	124.2	30	49.0	0.	0.0	0.	0.	0.	0.0	0.	0.
1110002	13.9 125.7	25	14.3 125.8	25	25.0	0.	13.8	123.4	30	25.0	5.	0.0	0.0	0.	0.	0.	0.0	0.
1110002	13.7 125.2	20	13.8 125.2	25	6.0	5.	0.0	0.0	0.	-0.0	0.	0.0	0.	0.	0.	0.0	0.	0.
1111002	13.5 124.6	20	13.5 124.6	25	6.0	5.	0.0	0.0	0.	-0.0	0.	0.0	0.	0.	0.	0.0	0.	0.
1111002	13.4 123.9	20	13.5 123.4	20	6.0	0.	0.0	0.0	0.	-0.0	0.	0.0	0.	0.	0.	0.0	0.	0.
1120002	13.4 123.3	15	0.0	0.0	0.	-0.	0.	0.0	0.	-0.0	0.	0.0	0.	0.	0.	0.0	0.	0.

ALL FORECASTS																		
WNRG	24-HR	48-HR	72-HR	WNRG	24-HR	48-HR	72-HR	WNRG	24-HR	48-HR	72-HR	WNRG	24-HR	48-HR	72-HR	WNRG	24-HR	48-HR
Avg Forecast Posit Error	40.	133.	401.	973.														
Avg High/Low Angle Error	33.	108.	349.	871.														
Avg Intensity Magnitude Error	1.	3.	11.	20.														
Avg Intensity Bias	1.	2.	11.	20.														
Number of Forecasts	12	9	5	1														

TYPHOON VIOLA

(November)

BEST TRACK			WARNING			24 HOUR FORECAST						48 HOUR FORECAST						72 HOUR FORECAST					
POS11	WIND	POS11	WIND	UST	WIND	POS11	WIND	UST	WIND	POS11	WIND	UST	WIND	POS11	WIND	UST	WIND	POS11	WIND	UST	WIND		
1110004	3.0	155.0	15	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.		
1110004	4.9	155.3	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.		
1110122	5.0	153.3	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.		
1110104	6.0	152.0	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.		
1110002	6.0	151.6	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.	-0.		
1110002	6.0	149.9	30	0.1	195.9	30.	6.0	10.	195.4	40.	6.0	10.	195.3	190.3	30.	8.0	187.8	132.1	0.0	16.0	-17.5		
1111124	6.0	148.5	35	0.0	148.0	30.	21.	-5.	148.5	45.	8.0	12.	147.1	134.9	30.	12.0	145.5	132.1	0.0	15.0	-25.0		
1111104	6.0	147.0	40	0.0	147.1	35.	0.0	11.	147.1	45.	1.0	12.	146.5	137.0	30.	5.0	143.3	131.7	0.0	7.0	-3.0		
1110004	6.0	145.0	45	0.0	145.7	40.	0.0	11.	147.0	45.	1.0	12.	146.0	137.0	30.	5.0	143.2	132.0	0.0	10.0	-5.0		
1110004	10.0	144.0	45	0.0	145.0	40.	0.0	11.	147.0	45.	1.0	12.	146.0	137.0	30.	5.0	143.0	132.0	0.0	10.0	-5.0		
1110124	10.0	143.1	45	10.0	143.0	45.	1.0	12.	146.0	137.0	0.0	3.0	145.0	131.1	0.0	10.0	142.0	130.0	0.0	10.0	-5.0		
1110104	11.0	141.0	50	11.0	141.0	40.	2.0	10.	141.0	50.	0.0	10.	142.0	127.1	0.0	2.0	142.0	127.1	0.0	10.0	-5.0		
1110002	11.0	140.4	50	11.0	140.4	40.	2.0	10.	141.0	50.	0.0	10.	142.0	127.1	0.0	2.0	142.0	127.1	0.0	10.0	-5.0		
1110002	12.0	138.0	50	12.0	138.0	40.	0.0	10.	139.0	50.	0.0	10.	140.0	127.0	0.0	10.	140.0	127.0	0.0	10.0	-5.0		
1110124	12.0	138.0	55	12.0	137.5	40.	0.0	10.	139.0	55.	0.0	10.	140.0	127.0	0.0	10.	140.0	127.0	0.0	10.0	-5.0		
1111104	12.0	137.3	60	13.0	137.0	40.	0.0	10.	139.0	55.	0.0	10.	140.0	127.0	0.0	10.	140.0	127.0	0.0	10.0	-5.0		
1110004	13.0	136.5	60	14.0	135.0	40.	0.0	10.	137.0	55.	0.0	10.	138.0	127.0	0.0	10.	138.0	127.0	0.0	10.0	-5.0		
1110004	14.0	135.0	65	14.0	135.0	40.	0.0	10.	136.0	65.	0.0	10.	137.0	127.0	0.0	10.	137.0	127.0	0.0	10.0	-5.0		
1110004	14.0	135.0	75	14.0	135.0	40.	0.0	10.	136.0	65.	0.0	10.	137.0	127.0	0.0	10.	137.0	127.0	0.0	10.0	-5.0		
1110124	14.0	134.8	75	14.0	134.8	40.	0.0	10.	136.0	65.	0.0	10.	137.0	127.0	0.0	10.	137.0	127.0	0.0	10.0	-5.0		
1110002	15.0	134.0	80	15.0	134.0	40.	0.0	10.	135.0	70.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110104	15.0	133.1	80	16.0	133.1	40.	0.0	10.	135.0	70.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	16.0	132.6	80	16.0	132.6	40.	0.0	10.	134.0	75.	0.0	10.	135.0	127.0	0.0	10.	135.0	127.0	0.0	10.0	-5.0		
1110124	16.0	131.7	80	16.0	131.6	40.	0.0	10.	134.0	75.	0.0	10.	135.0	127.0	0.0	10.	135.0	127.0	0.0	10.0	-5.0		
1111104	17.0	130.8	80	17.0	130.7	40.	0.0	10.	134.0	75.	0.0	10.	135.0	127.0	0.0	10.	135.0	127.0	0.0	10.0	-5.0		
1110002	18.0	129.9	80	18.0	129.7	40.	0.0	10.	134.0	75.	0.0	10.	135.0	127.0	0.0	10.	135.0	127.0	0.0	10.0	-5.0		
1110002	19.0	129.1	80	19.0	129.0	40.	0.0	10.	134.0	75.	0.0	10.	135.0	127.0	0.0	10.	135.0	127.0	0.0	10.0	-5.0		
1110124	20.0	128.3	80	19.0	128.0	40.	0.0	10.	134.0	75.	0.0	10.	135.0	127.0	0.0	10.	135.0	127.0	0.0	10.0	-5.0		
1110002	21.0	128.5	80	21.0	128.4	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	21.0	128.1	85	21.0	128.0	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	22.0	127.0	85	22.0	126.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110124	22.0	126.0	85	22.0	125.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	23.0	125.0	85	23.0	124.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	23.0	124.0	85	23.0	123.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	24.0	123.0	85	24.0	122.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	24.0	122.0	85	24.0	121.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	25.0	121.0	85	25.0	120.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	25.0	120.0	85	25.0	119.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	25.0	119.0	85	25.0	118.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	25.0	118.0	85	25.0	117.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	25.0	117.0	85	25.0	116.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	116.0	85	26.0	115.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	115.0	85	26.0	114.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	114.0	85	26.0	113.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	113.0	85	26.0	112.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	112.0	85	26.0	111.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	111.0	85	26.0	110.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	110.0	85	26.0	109.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	109.0	85	26.0	108.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	108.0	85	26.0	107.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	107.0	85	26.0	106.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	106.0	85	26.0	105.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	105.0	85	26.0	104.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	104.0	85	26.0	103.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	103.0	85	26.0	102.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	102.0	85	26.0	101.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	101.0	85	26.0	100.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	100.0	85	26.0	99.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	99.0	85	26.0	98.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0	-5.0		
1110002	26.0	98.0	85	26.0	97.9	40.	0.0	10.	135.0	75.	0.0	10.	136.0	127.0	0.0	10.	136.0	127.0	0.0	10.0			

ALL FORECAST

TYPHOONS WHILE OVER 35 KTS

WING 24-HH

BRING 74-MH 40-MH 12-MH

Avg FOMELAST POSIT ERRO
Avg High Angle Error
Avg Intensity Magnitude
Avg Intensity Bias

TROPICAL STORM WINNIE

(November)

WEST TRACK			WARNING			24 HOUR FORECAST						48 HOUR FORECAST						72 HOURS FORECAST		
POSIT	WIND	POSIT	WIND	POSIT	WIND	POSIT	WIND	DIST	WIND	POSIT	WIND	POSIT	WIND	POSIT	WIND	POSIT	WIND	POSIT	WIND	
112512Z	9.4	147.7	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
112518Z	9.7	147.7	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
112600Z	10.0	147.8	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
112606Z	10.0	147.9	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
112612Z	10.0	148.3	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
112618Z	10.0	148.7	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
112700Z	10.0	149.2	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0
112706Z	11.0	149.5	30	11.7	149.5	30	6	0.	12.5	147.2	45	21.0	10	12.0	144.9	55	50.2	0.	0.0	0.0
112712Z	12.0	149.0	30	12.0	149.1	30	36	0.	12.0	149.0	45	28.0	5	12.0	149.5	55	60.8	0.	0.0	0.0
112718Z	13.7	148.6	35	12.0	148.7	30	64	0.	13.0	149.6	45	30.0	14.1	149.0	55	65.1	5	0.0	0.0	0.0
112800Z	14.7	147.8	35	14.9	147.7	35	13	0.	20.0	147.1	50	60	14.0	147.0	50	35.5	20	0.0	0.0	0.0
112806Z	16.0	147.5	35	15.7	147.4	35	19	0.	19.0	147.1	50	60	16.0	147.0	50	30	0.	0.0	0.0	0.0
112812Z	17.7	146.8	40	16.8	147.1	40	61	0.	20.5	147.4	50	24.0	17.0	146.0	50	30	0.	0.0	0.0	0.0
112818Z	19.5	146.4	45	19.1	145.9	45	37	0.	24.7	147.3	50	24.0	19.0	146.0	50	30	0.	0.0	0.0	0.0
112900Z	20.7	146.2	55	21.2	146.1	55	30	0.	27.0	150.1	45	24.0	20.0	146.0	50	30	0.	0.0	0.0	0.0
112906Z	22.5	147.4	55	22.4	146.6	55	45	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.0
112912Z	24.4	149.0	55	24.0	148.2	30	47	-5	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.0
112918Z	26.0	151.7	50	26.5	151.9	50	12	0.	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.0
113000Z	28.0	155.8	45	28.2	155.1	45	29	5	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.	0.0	0.0	0.0

ALL FORECASTS

WING 24-MR 48-MH 72-MR
26 22 61 0

48 HUJUN FANGCAST

ENHANCED

Avg Forecast Posit Errn
Avg Right Angle Errnor
Avg Intensity Magnitude
Avg Intensity Bias
Number of Forecasts

THE WIND US
Ball No 21

NUMBER OF FORECASTS

2. NORTH INDIAN OCEAN CYCLONE TRACK DATA

TC18-78

(MAY)

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST						
POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	
515024	10.5 88.9 20	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515082	10.0 89.1 20	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515142	11.1 89.2 20	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515202	11.9 89.4 20	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515262	11.0 89.5 25	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515322	12.0 89.6 25	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515402	12.3 89.7 30	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515462	12.7 89.8 30	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515502	13.0 89.9 30	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515562	14.1 90.1 35	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515622	14.9 90.4 35	15.7 92.6 35	15.7 92.6 35	0.0 0.0 0.	0. -0. 0.	17.7 93.6 40	12.0 93.6 40	-5. 0. 0.	19.2 94.6 25	7. 0. 0.	5. 0. 0.	0. 0. 0.	0. 0. 0.	0. 0. 0.	0. 0. 0.	0. 0. 0.	0. 0. 0.	0. 0. 0.
515682	16.4 90.8 35	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515742	16.6 90.8 40	16.5 90.8 40	16.5 90.8 40	0.0 0.0 0.	0. -0. 0.	18.7 91.1 40	10.0 90.8 20	+2.0 0. 0.	0.0 0.0 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515802	17.7 90.6 40	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515862	18.6 91.1 45	18.6 91.1 45	18.6 91.1 45	0.0 0.0 0.	0. -0. 0.	21.0 94.6 30	3.0 93.0 10	+10. 0. 0.	0.0 0.0 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515922	18.9 92.1 50	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
515982	19.7 93.0 50	19.5 92.5 35	19.5 92.5 35	3.0 3.0 0.	-25. 0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
516142	19.7 93.8 45	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
516202	20.0 94.5 20	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	

ALL FORECASTS

MMNG	24-HR	48-HR	72-HR
Avg Forecast Posit Error	55.	88.	78.
Avg Height Angle Error	51.	41.	45.
Avg Intensity Magnitude Error	10.	12.	5.
Avg Intensity Bias	-10.	-5.	5.
Number of Forecasts	4	3	1
	0	0	0

TC19-78

(OCTOBER)

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST						
POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	
1024022	8.5 96.9 20	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
102462	9.0 95.4 20	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025142	10.7 93.8 20	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025202	11.6 92.2 25	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025262	12.0 91.0 25	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025322	12.5 90.0 25	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025402	12.9 89.1 30	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025462	13.0 89.4 30	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025522	13.5 89.9 30	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025582	14.0 89.1 35	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025622	15.0 88.5 30	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025682	15.6 87.9 35	15.7 87.1 35	15.6 87.1 35	35. 35. 0.	-18.0 18.6 0.	35. 19.3 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.
1025742	16.5 87.4 35	16.7 87.2 35	16.7 87.2 35	17.0 0.	19.7 83.2 0.	23.7 23.7 0.	-15. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025802	17.4 87.0 35	17.8 86.8 35	17.8 86.8 35	35. 35. 0.	57. 0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025862	18.0 87.4 35	18.5 86.9 35	18.5 86.9 35	29. 29. 0.	0.0 0.0 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1025922	19.4 88.1 35	19.6 88.7 35	19.6 88.7 35	34. 0.	21.1 93.6 0.	20. 17.8 0.	-5. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1027142	20.0 89.0 40	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1027202	20.8 89.8 40	21.0 90.6 40	21.0 90.6 40	46. 46. 0.	0.0 0.0 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1027262	21.0 90.3 35	22.2 90.4 25	22.2 90.4 25	25. 25. 0.	-10. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	
1028082	22.7 90.7 25	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0.	0.0 0.0 0.	0. -0. 0									

TC20-78
(NOVEMBER)

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST									
POSIT	WIND	POSIT	WIND	DST WIND	ERRORS	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND	POSIT	WIND	DST WIND							
11030204	9.5	80.8	15	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
1103142	9.8	79.9	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
11030204	10.1	78.8	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
11030222	10.2	77.9	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
11030204	10.4	76.9	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
1103142	10.5	76.0	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
11030204	10.6	75.0	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
11030222	10.6	74.3	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
11030204	10.8	73.5	20	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
1103142	10.7	72.9	25	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
11030204	10.9	72.3	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
11030222	11.3	71.9	30	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.							
11030204	11.9	71.3	35	11.0	72.0	35.	68.	0.	11.6	64.6	45.	213.	-5.	12.6	67.2	55.	334.	-20.	0.0	0.0	0.
1103142	12.5	70.3	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030204	13.0	69.3	40	12.1	70.3	40.	79.	0.	13.6	67.6	50.	183.	-10.	14.5	64.8	50.	249.	-20.	0.0	0.0	0.
1103142	13.0	68.3	45	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030204	14.2	67.1	50	13.5	67.1	50.	43.	0.	15.3	64.2	50.	93.	-5.	16.0	62.1	70.	221.	-10.	0.0	0.0	0.
1103142	14.7	66.1	55	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030204	15.4	65.0	60	15.2	65.5	60.	31.	0.	16.2	64.8	60.	13.	-10.	20.9	60.9	70.	100.	-5.	0.0	0.0	0.
11030222	16.4	64.6	70	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030204	16.7	63.5	75	16.9	62.8	75.	42.	0.	16.9	57.7	70.	263.	-10.	0.0	0.0	0.	0.0	0.0	0.0	0.0	0.
1103142	17.4	62.9	75	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030204	18.1	62.0	80	17.5	61.4	80.	72.	0.	19.0	57.5	70.	313.	-5.	0.0	0.0	0.	0.0	0.0	0.0	0.0	0.
11030222	18.9	62.4	80	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030204	19.7	62.3	80	19.2	62.0	80.	34.	10.	21.0	62.4	80.	67.	20.	23.9	65.6	75.	120.	35.	0.0	0.0	0.
1103142	20.3	62.4	75	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030204	20.9	62.7	75	21.7	63.2	85.	55.	10.	24.2	67.7	80.	175.	10.	0.0	0.0	0.	0.0	0.	0.0	0.0	0.
11030222	21.5	63.1	65	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030204	21.9	63.6	60	22.3	64.1	75.	37.	15.	24.9	69.5	50.	186.	-10.	0.0	0.0	0.	0.0	0.0	0.0	0.0	0.
1103142	22.3	64.4	55	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030204	22.5	65.1	50	23.5	66.8	50.	78.	15.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11030222	22.7	66.3	45	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
11110204	22.9	67.5	40	22.6	66.5	40.	58.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
1111142	23.0	68.4	35	0.0	0.0	0.	-0.	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	
1111202	23.0	69.3	20	23.1	70.2	45.	50.	5.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	0.0	0.0	0.	

ALL FORECASTS
WING 24-HR 48-HR 72-HR
AVG FORECAST POSIT ERROR 54. 165. 205. 0.
AVG HIGHT ANGLE ERROR 75. 101. 102. 0.
AVG INTENSITY MAGNITUDE ERROR 5. 9. 18. 0.
AVG INTENSITY BIAS 5. -3. -4. 0.
NUMBER OF FORECASTS 12 9 5 0

TC21-78

(NOVEMBER)

BEST TRACK			WARNING			24 HOUR FORECAST			48 HOUR FORECAST			72 HOUR FORECAST					
POSIT	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND	POSIT	WIND	DST	WIND
111902	6.0 40.9 30	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
112002	7.0 40.3 35	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120082	7.0 84.0 40	0.0 0.0 0.	0.0 0.0 0.	40.	0.	8.0 84.5 00.	0.0 0.0 0.	10.	0.	9.0 85.3 70.	0.0 0.0 0.	120.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120142	7.0 49.4 40	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120202	7.0 48.9 40	8.0 0.0 0.	8.0 0.0 0.	40.	0.	9.0 85.5 00.	150.	5.	0.	9.0 81.5 75.	232.	-5.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120222	7.0 88.4 45	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120282	7.0 87.7 50	7.0 0.0 0.	8.0 0.0 0.	50.	25.	0.	7.0 84.7 00.	51.	-10.	7.0 79.9 50.	160.	-100.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120342	7.0 87.1 50	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120402	7.0 86.5 55	7.0 0.0 0.	8.0 0.0 0.	55.	21.	0.	7.0 83.5 05.	30.	-15.	6.0 78.7 50.	158.	-200.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120422	7.0 85.9 60	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120482	6.0 45.2 70	6.0 0.0 0.	8.0 0.0 0.	17.	-10.	6.0 81.0 10.	70.	-20.	6.0 77.1 05.	251.	15.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1120542	6.0 84.7 75	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120602	6.0 24.1 80	6.0 0.0 0.	8.0 0.0 0.	12.	-15.	6.0 81.4 10.	112.	0.	6.0 76.6 05.	253.	35.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1120622	7.0 43.5 85	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120682	7.0 82.6 90	7.0 0.0 0.	8.0 0.0 0.	15.	27.	6.0 80.4 05.	179.	15.	6.0 76.6 00.	344.	50.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1120742	7.0 81.8 90	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120802	6.0 40.9 70	7.0 0.0 0.	8.0 0.0 0.	38.	0.	7.0 74.3 00.	152.	30.	8.0 75.5 00.	283.	25.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1120822	6.0 80.2 55	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120882	9.0 179.3 50	8.0 0.0 0.	79.0 0.0 0.	50.	15.	8.0 77.1 00.	222.	30.	9.0 74.0 00.	300.	35.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1120942	9.0 178.3 40	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1120982	10.0 77.2 30	9.0 0.0 0.	77.0 0.0 0.	35.	5.	10.0 74.0 00.	147.	-10.	13.0 71.3 00.	35.	105.	10.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1121022	10.0 75.6 30	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1121082	11.0 74.3 30	11.0 74.5 40	27.	10.	14.0 71.0 00.	50.	61.	15.	16.0 69.9 60.	133.	40.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1121142	11.0 73.4 30	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1121202	12.0 72.5 35	11.0 72.3 45	35.	38.	10.	13.0 69.2 00.	50.	35.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1121262	12.0 71.8 35	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1121322	13.0 71.2 35	13.0 70.7 55.	31.	20.	15.0 68.1 00.	45.	40.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1121382	13.0 70.5 30	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1121442	13.0 69.9 25	14.0 70.2 55.	17.	30.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1121502	13.0 69.1 25	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.
1121562	13.0 68.4 20	14.0 68.6 35.	17.	15.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	
1121622	13.0 67.8 20	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.	0.0 0.0 0.	0.0 0.0 0.	-0.	0.

ALL FORECASTS				
#HNG	24-HR	48-HR	72-HR	
Avg Forecast Posit Error	71.	104.	213.	0.
Avg Height Angle Error	18.	62.	147.	0.
Avg Intensity Magnitude Error	10.	18.	25.	0.
Avg Intensity Bias	5.	10.	13.	0.
Number of Forecasts	16	13	11	0

ANNEX B - TROPICAL CYCLONE FIX DATA

1. WESTERN NORTH PACIFIC CYCLONE FIX DATA

NOTE 1: FIXES PRECEDED BY AN ASTERISK (*) WERE NOT CONSIDERED REPRESENTATIVE AND WERE NOT USED IN DETERMINING BEST TRACK.

NOTE 2: UNDER "SITE" COLUMN, ICAO IDENTIFIER IS INDICATED WITH THE EXCEPTION OF FLEET WEATHER FACILITY, SUITLAND WHICH IS ENCODED "FWFS".

TROPICAL STORM NADINE

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX	POSITION	ACCRY	ORIGIN CODE	SAT.	COMMENTS	SITE
*	080218	84N 170.0E		T15N		G082	INITIAL OBS	PHNL
6	081234	7.5N 164.4E	PCN 6	T0.0/2.0+		D081		PG14
3	082043	5.5N 164.4E	PCN 6	T0.0/2.0+		D081	INITIAL OBS	PG14
*	082133	4.5N 164.3E	PCN 6			N081		PG14
5	071509	8.5N 167.4E	PCN 6			D081		PG14
6	071221	4.5N 167.2E	PCN 6			D081		PG14
7	071221	4.5N 167.3E	PCN 6			D081		KG/C
8	070426	10.5N 169.0E	PCN 6	T1.0/1.0 / 7.0+0/24HRS		D081		PG14
*	072253	2.5N 166.5E	PCN 6			N081		PG14
10	080103	10.5N 164.9E	PCN 6			D081		PG14
11	080408	2.5N 161.7E	PCN 6			D081	CI SAME	PG14
12	080325	9.5N 161.8E	PCN 6			N081		PG14
13	081204	9.5N 161.3E	PCN 6			D081		KG/C
14	082008	9.5N 161.1E	PCN 6	T1.0/1.0 / 7.0+0/24HRS		D081		PG14
15	042157	17.5N 167.9E	CONV 1	T1.5/1.5 / 7.0+0/24HRS		N081	INITIAL OBS	FWFS
16	082201	17.5N 167.0E	PCN 6			N081		PG14
17	090205	11.5N 167.7E	PCN 6			D081		PG14
18	090355	11.5N 167.1E	CONV 1			N081		FWFS
19	090320	11.5N 167.1E	PCN 6			D081		KG/C
20	090851	10.5N 161.7E	PCN 6			D081	CI SAME	PG14
21	091038	10.5N 161.5E	PCN 6			N081		PG14
22	091529	10.5N 161.5E	PCN 6			D081		PG14
23	091251	11.5N 161.3E	PCN 6	T1.5/1.5/0		D081	INITIAL OBS	KG/C
24	091251	11.5N 161.9E	PCN 6			D081	EDGE OF DATA	PG14
25	092117	10.5N 161.0E	PCN 6	T1.0/1.0 / 7.0+0/24HRS		N081	INITIAL OBS	PG14
26	092309	11.5N 161.5E	CONV 1	T0.5/2.5 / 7.0+0/24HRS		N081		FWFS
27	100028	11.5N 161.8E	PCN 6			D081		PG14
28	100833	12.5N 160.7E	PCN 6			D081		KG/C
29	100834	12.5N 160.8E	PCN 6			D081	CI UP	PG14
30	100859	12.5N 160.9E	PCN 6			N081		PG14
31	101310	13.5N 160.5E	PCN 6			D081		PG14
32	102115	13.5N 160.1E	PCN 6	T1.0/1.0		D081	INITIAL OBS	KG/C
33	102115	13.5N 160.1E	PCN 6			D081		PG14
34	152225	14.5N 160.4E	CONV 1	T3.5/3.5 / 7.0+0/24HRS		N081		FWFS
35	102230	14.5N 160.2E	PCN 6	T2.5/2.0 / 7.0+0/24HRS		N081		PG14
36	110010	14.5N 160.4E	PCN 6			D081		PG14
37	110818	15.5N 160.8E	PCN 6			D081		KG/C
38	110817	15.5N 160.9E	PCN 6			D081	CI UP	PG14
39	110910	15.5N 161.7E	PCN 6			N081		PHIK
40	110910	15.5N 161.0E	PCN 6			N081		PG14
41	110915	15.5N 161.0E	CONV 1	T4.5/4.0 / 7.0+0/24HRS		N081		FWFS
42	111252	15.5N 161.9E	PCN 6			D081		PG14
43	112145	15.5N 161.3E	PCN 6	T4.0/4.0		N081	INITIAL OBS	PHIK
44	112156	17.5N 161.7E	PCN 2	T3.5/3.5 / 7.0+0/24HRS		N081		PG14
45	112335	16.5N 164.9E	CONV 3	T9.5/4.5 / 7.0+0/24HRS		N081		FWFS
46	112323	17.5N 164.2E	PCN 2			D081		PG14
47	120755	18.5N 167.0E	PCN 4	T3.5/3.5		D081		KG/C
48	120759	17.5N 166.8E	PCN 6			D081		PHIK
49	120925	17.5N 167.1E	PCN 6			N081		PG14
50	120925	17.5N 167.3E	PCN 6			N081	POORLY DEFINED	PHIK
51	121915	14.5N 164.8E	PCN 6			D081		PG14
52	122054	20.5N 170.4E	CONV 1	T3.0/3.0 / 7.0+0/24HRS		N081		FWFS
53	122102	20.5N 171.0E	PCN 6	T2.0/2.0 / 7.0+0/24HRS		N081		PG14
54	122102	20.5N 171.3E	PCN 6	T3.0/4.0 / 7.0+0/24HRS		N081		PHIK
55	122299	21.5N 171.0E		T3.0		G082	INITIAL OBS	PHNL
56	130349	22.5N 173.5E				G082		

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX	FLT LVL	4IN HGT	HSLP	MAR-FRC-4ND VEL/ARG/RVG	MAR-LVL-4ND HGT/VEL/BRD/IND NAV/MET	ACCRY	EYE SHAPE	EYE DIRECTION	EYE TEMP (C)	WST NO.	
1	080248	9.5N 161.9E	1500FT	0381	996	035 290 020	130 033 290 140	10 15		+24 +24 +24	24	03	
2	090515	10.5N 161.9E	700MB	1058	996	030 180 042	260 030 180 042	04 07		+11 +12 +10	05	-	
3	091534	10.5N 161.1E	700MB	1024	995		140 030 270 060	15 45		+12 +12 +12	05	-	
4	100315	11.5N 161.3E	700MB	1031		030 230 150		04 08		+11 +10 +10	05	-	
5	101504	11.5N 160.2E	700MB	2955	985		310 038 220 014	10 05		+11 +13 +12	07	-	
6	110325	14.5N 160.7E	700MB	2941	981	040 290 050	350 050 290 050	05 05		+12 +14 +11	05	-	
7	111647	14.5N 162.1E	700MB	2882	976		350 053 270 021	10 10	ELLIPICAL	70 50 150	+13 +15 +11 25	09	-
8	120304	17.5N 164.3E	700MB	2870	973	050 160 012	320 070 270 040	04 10		+11 +20 +20	10	-	
9	121813	19.5N 170.1E	700MB	2852	972		330 058 280 020	10 07	CIRCULAR	20	+13 +14 +11	11	-

TYPHON OLIVE

SATELLITE FIXES

FIX NO.	TIME (Z)	LAT	LONG	ACCY	JWTRAK CODE	SAT	COMMENTS	SITE
L	152305	3.4N	140.3E	PCV 5	T0.0/0.0	NOAA5		PGTM
C	152305	3.4N	140.0E	PCV 5		NOAA5		PGTM
3	152201	3.4N	140.3E	PCV 5	T1.0/1.0 /01.0/24HRS	NOAA5		PGTM
4	152201	3.4N	141.3E	PCV 5		DNSP3A	CI SAME	PGTM
5	152201	3.4N	141.3E	PCV 5		NOAA5		PGTM
6	152201	3.4N	140.3E	PCV 5		DNSP3A		PGTM
7	152201	3.4N	140.3E	PCV 5		DNSP3A		PGTM
8	152201	3.4N	140.3E	PCV 5		DNSP3A		PGTM
9	152201	3.4N	140.3E	PCV 5		DNSP3A		PGTM
10	171033	7.2N	137.1E	PCV 5		NOAA5	CI SAME	PGTM
11	171115	7.2N	137.3E	PCV 5		DNSP3A		PGTM
12	172216	4.4N	136.0E	PCV 5	T0.0/0.0	DNSP3A		RPMK
13	172217	4.4N	136.7E	PCV 5	T1.0/1.0 /50.0/24HRS	DNSP3A		PGTM
14	172209	4.4N	136.4E	PCV 5		NOAA5		PGTM
15	140205	4.4N	136.0E	PCV 5		DNSP3A		PGTM
16	140205	4.4N	136.0E	PCV 5		DNSP3A		RPMK
17	181205	2.4N	133.1E	PCV 5		DNSP3A	CI UP	PGTM
18	181205	2.4N	133.1E	PCV 5		DNSP3A		RPMK
19	141145	2.4N	132.9E	PCV 5		NOAA5		PGTM
20	141145	2.4N	132.3E	PCV 5		DNSP3A		PGTM
21	141145	2.4N	131.6E	PCV 5		DNSP3A		PGTM
22	141145	2.4N	130.0E	PCV 5	T2.0/2.0 /02.0/24HRS	DNSP3A		RPMK
23	141145	2.4N	129.0E	PCV 5		DNSP3A		RDN
24	190202	9.2N	129.3E	PCV 5		NOAA5		PGTM
25	190202	9.2N	129.0E	CONF 2	T3.0/3.0 /02.0/24HRS	NOAA5		FWS
26	190202	9.2N	129.0E	CONF 2	T3.5/3.5 /02.0/24HRS	UNSP		RPMK
27	191201	9.4N	128.8E	PCV 5		DNSP3A	GUOU JTFLW	PGTM
28	191201	10.4N	127.7E	PCV 5		DNSP3A	CI UP	RPMK
29	191201	10.4N	127.7E	PCV 5		DNSP3A	CI UP	PGTM
30	191201	10.4N	127.7E	PCV 5		DNSP3A		PGTM
31	191201	10.4N	126.4E	PCV 5	T4.0/4.0 /01.0/23HRS	DNSP3A		PGTM
32	191201	11.4N	126.4E	PCV 5	T4.0/4.0	DNSP3A		PGTM
33	192305	11.5N	124.6E	PCV 5		NOAA5		RDN
34	200134	11.5N	124.4E	PCV 5		NOAA5		PGTM
35	200134	11.5N	124.4E	CONF 1	T4.5/4.5 /01.0/24HRS	DNSP		FWS
36	201205	12.5N	122.1E	PCV 5		DNSP3A		RPMK
37	201205	12.5N	122.0E	PCV 5		NOAA5		PGTM
38	202305	13.5N	119.6E	PCV 5	T3.5/3.5+/-0.5/24HRS	DNSP3A		RKS0
39	202305	13.5N	119.5E	PCV 5	T3.5/3.5	DNSP3A		PGTM
40	210050	14.2N	119.5E	PCV 5		NOAA5		PGTM
41	210222	13.6N	119.2E	PCV 5		DNSP3A		RKS0
42	210222	13.6N	119.3E	PCV 5		DNSP3A		PGTM
43	211145	14.3N	117.4E	PCV 5		DNSP3A	CI UP	RDK
44	212209	14.3N	116.5E	PCV 5		DNSP3A		PGTM
45	220006	14.3N	116.4E	PCV 5	T4.0/4.0	NOAA5		PGTM
46	220031	14.3N	116.4E	PCV 5		DNSP3A		RPMK
47	220235	14.3N	116.0E	PCV 5		DNSP3A		PGTM
48	220235	13.9N	116.0E	PCV 5		DNSP3A		RPMK
50	221131	14.5N	115.3E	PCV 5		DNSP3A		RPMK
51	221131	14.5N	115.3E	PCV 5		DNSP3A		PGTM
52	221202	14.7N	114.8E	PCV 5		NOAA5		PGTM
53	221202	15.0N	114.6E	PCV 5		DNSP3A		RDN
54	230013	15.3N	113.7E	PCV 5	T5.0/5.0	DNSP3A	KDSC	RPMK
55	230013	16.0N	113.5E	PCV 5	T5.0/5.0	DNSP3A		RPMK
56	230013	16.0N	113.4E	PCV 5	T5.0/5.0	NOAA5		RDN
57	230359	16.5N	113.4E	PCV 5		DNSP3A		RPMK
58	230359	16.5N	113.2E	PCV 5		DNSP3A		RPMK
59	241155	16.4N	112.8E	PCV 5		NOAA5		PGTM
60	231255	17.4N	112.9E	PCV 5		DNSP3A		RDN
61	231540	17.5N	114.3E	PCV 5		DNSP3A		RPMK
62	231543	17.5N	113.3E	PCV 5		DNSP3A		RDN
63	232355	14.5N	113.9E	PCV 5	T5.0/5.0	DNSP3A		RDN
64	232355	14.5N	113.9E	PCV 5	T5.0/5.0	DNSP3A		RPMK
65	240335	14.5N	113.5E	PCV 5		NOAA5		RDN
66	240304	14.3N	114.2E	PCV 5		DNSP3A		RDN
67	240304	14.3N	114.1E	PCV 5		DNSP3A		RPMK
68	240345	14.3N	114.5E	CONF 1		DNSP		FWS
69	241238	14.5N	115.9E	PCV 5		DNSP3A		RDN
70	241523	14.5N	117.6E	PCV 5		DNSP3A		RDN
71	241523	20.0N	117.9E	PCV 5		DNSP3A	CI DOWN	RPMK
72	242339	21.0N	118.7E	PCV 5	T4.0/4.0	DNSP3A		RKS0
73	242339	20.5N	118.9E	PCV 5	T3.0/4.0 /W2.0/24HRS	DNSP3A		RPMK
74	250323	21.0N	119.7E	PCV 5		DNSP3A		RPMK
75	250323	21.0N	119.9E	CONF 2		DNSP		FWS
76	251221	21.5N	124.5E	PCV 5		DNSP3A		RKS0
77	251221	21.5N	123.4E	PCV 5		DNSP3A		RPMK
78	251227	21.5N	124.0E	PCV 5		NOAA5		PGTM
79	251505	22.0N	126.0E	PCV 5		DNSP3A		RKS0
80	252422	22.1N	127.2E	PCV 5	T3.0/3.0 /50.0/24HRS	DNSP3A		RPMK
81	252322	22.4N	129.3E	PCV 5		DNSP3A		RDN
82	260103	22.4N	127.5E	PCV 5	T3.0/4.0 /W2.0/25HRS	NOAA5		PGTM
83	260305	22.5N	126.3E	PCV 5	T3.0/4.0 /W1.0/27HRS	DNSP3A		RKS0
84	261022	22.7N	131.5E	PCV 5		DNSP3A		RKS0
85	261022	22.4N	131.0E	PCV 5		DNSP3A		PGTM
86	261143	22.3N	131.3E	PCV 5		NOAA5		PGTM
87	261405	22.4N	132.2E	PCV 5		DNSP3A		PGTM
88	262305	23.4N	135.0E	PCV 4		DNSP3A		PGTM
89	270019	21.3N	135.0E	PCV 4		NOAA5		PGTM

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FLX POSITION	FLT LVL	MIV HGT	MSP VEL/ARG/RNG	MAX-SFC-WND DIR/VEL/BRG/ANG	MAX-FLT-LVL-WND NAV/MET	ACCRY	EYE SHAPE	EWE ORIEN-DIM/TATION	EWE TEMP (C)	HW NO.
1	170023	4.3N 141.1E	1500FT	1005	025 030 050	090 021 020	050 05 10			+22 +22 28	01	
2	140121Z	4.5N 134.4E	1500FT	1003	035 030 030	060 038 030	030 04 02			+27 +23	02	
3	180252	4.5N 134.6E	700MB	1003				06 05		+11 +11	02	
4	181553	4.2N 131.8E	700MB	1057	997		110 038 060	126 05 05	ELLiptical	20 10 110	+12 +11	03
5	190111	1n.0N 129.4E	700MB									04
6	190322	4.3N 129.1E	700MB	1003	992	030 020 010	150 060 030	020 05 05	Circular	12	+12 +15 +1n	04
7	191535	10.7N 127.4E	700MB	2986	989		030 055 030	040 15 20			+18 +14 +11	05
8	192330	11.1N 125.5E	700MB	2881			160 077 060	040 03 10	Circular	25	+16 +14 +11	05
9	200915	12.1N 122.8E	619MB		982		210 065 120	025 05 05	Circular	25	+04 +07	06
10	202103	13.0N 120.0E	700MB	1013	995		260 049 240	017 05 05	Circular	06	+10 +13 +12	07
11	202315	13.0N 119.7E	700MB									07
12	210233	13.0N 119.3E	700MB	3013	995		300 065 050	050 05 05	Elliptical	30 10 090	+12 +13 +11	07
13	210345	13.0N 114.4E	700MB	2945	985	030 290 020	030 040 290	030 05 08			+13 +16 +10	08
14	220150	13.0N 116.4E	700MB									09
15	220442	14.1N 115.8E	700MB	2834		060 230 012	240 077 240	025 04 03	Elliptical	35 30 160	+10 +18 +12	09
16	221234	14.3N 115.0E	700MB									10
17	221530	15.2N 114.4E	700MB	2741	958							10
18	240330	18.0N 114.2E	700MB	2692	956	030 150 018	240 090 170	063 04 08	Circular	30	+13 +18	10
19	240537	19.0N 115.1E	700MB	2682		030 200 019	200 090 120	022 04 04	Circular	20	+13 +20	12
20	242103	20.4N 118.0E	700MB	2823	970		230 110 150	035 05 05	Circular	30	+11 +16	12
21	250233	21.0N 119.4E	700MB	2849	974		210 110 120	030 05 05	Elliptical	60 20 200	+12 +17 +12	13
22	250330	21.2N 119.4E	700MB									13
23	251530	21.5N 124.6E	700MB	2920	983		300 065 210	060 03 08			+13 +15 +14	14
24	251749	21.7N 125.1E	700MB									14
25	260350	21.9N 128.3E	700MB	2926	979	030 260 012	260 085 090	060 15 03			+15 +17	15

RADAR FIXES

FIX NO.	TIME (Z)	FLX POSITION	RADAR	ACCRY	EYE SHAPE	EYF	RANDR-CODE	DIAm	ASWAN TDDFF	COMMENTS	RADAR POSITION	SITE#	HW NO.
1	192220	-11.2N 124.3E	LAND								11.0N 125.7E	06550	
2	192300	-11.2N 124.2E	LAND	6000		011					11.0N 125.7E	06550	
3	200000	-11.0N 123.8E	LAND	6000		017					11.0N 125.7E	06550	
4	200100	-11.2N 123.8E	LAND	6000		012					11.0N 125.7E	06550	
5	200200	-11.2N 123.5E	LAND	6000		012					11.0N 125.7E	06550	
6	240400	-14.3N 114.0E	LAND				20902	////			22.3N 114.2E	45005	
7	240500	-14.3N 114.4E	LAND				20912	////			22.3N 114.2E	45005	
8	240700	-19.2N 114.8E	LAND				20912	////			22.3N 114.2E	45005	
9	241200	-14.3N 115.4E	LAND				30912	////			22.3N 114.2E	45005	
10	241500	-19.3N 116.3E	LAND				35//	70719			22.3N 114.2E	45005	
11	250000	-20.7N 118.4E	LAND				25///	50523			22.6N 120.3E	46744	
12	250100	-20.7N 119.0E	LAND				25///	50907			22.6N 120.3E	46744	
13	250100	-20.7N 119.2E	LAND				25///	50808			22.6N 120.3E	46744	
14	250300	-20.8N 119.4E	LAND				25///	08016			22.6N 120.3E	46744	
15	250400	-20.8N 119.6E	LAND				25///	10809			22.6N 120.3E	46744	
16	250500	-20.8N 120.1E	LAND				25///	10926			22.6N 120.3E	46744	
17	250500	-21.1N 120.6E	LAND				25///	10626			22.6N 120.3E	46744	

TROPICAL STORM POLLY

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DATAK CODE	SAT	COMENTS	SITE	
*	1	131305	21.4N 136.4E	CONE 2	DNSP		FDFS	
6	130253	21.4N 136.4E	PCN 3	TELE240	DNSP	INIT JAS	PGLd	
3	130005	21.4N 136.4E	PCN 4		DNSP		PGLd	
*	4	130205	21.4N 136.4E	PCN 3	DNSP	SECONDARY AT 19.2N 136.4E	PGLd	
2	130214	21.4N 136.4E	CONE 2	TELE240	Z000.5Z24HRS	DNSP	FDFS	
9	130207	21.4N 136.4E	PCN 4		DNSP	CL SAME EXPOSED LOW LVL CIRC	PGLd	
7	131130	21.4N 136.4E	PCN 3		DNSP		RNSD	
8	131130	21.4N 136.4E	PCN 4		DNSP	CL SAME EXPOSED LOW LVL CIRC	PGLd	
*	9	131155	19.2N 136.4E	CONE 2	TELE240	Z000.5Z24HRS	DNSP	FDFS
10	130209	21.4N 136.4E	PCN 3		DNSP	CL SAME	PGLd	
11	130231	21.4N 136.4E	PCN 3	TELE240	Z000.5Z24HRS	DNSP	INIT JAS	RNSD
12	130231	21.4N 136.4E	PCN 3	TELE240	Z000.5Z24HRS	DNSP	PGLd	
13	130231	21.4N 136.4E	PCN 4		DNSP		PGLd	
14	130151	21.4N 136.4E	PCN 3		DNSP		RNSD	
*	15	130157	21.4N 136.4E	CONE 2	TELE240	Z000.5Z24HRS	DNSP	FDFS
*	16	130400	19.2N 136.4E	CONE 2	TELE240	Z000.5Z24HRS	DNSP	FDFS
17	130214	21.4N 136.4E	PCN 3	TELE240	Z000.5Z24HRS	DNSP	PGLd	
18	130031	21.4N 136.4E	PCN 3		DNSP		PGLd	
19	130133	21.4N 136.4E	PCN 3		DNSP		PGLd	
*	20	130554	21.4N 136.4E	CONE 2	DNSP		FDFS	
*	21	130107	21.4N 136.4E	PCN 3	DNSP		RDN	
22	130109	21.4N 136.4E	PCN 6		DNSP		PGLd	
23	131111	21.4N 136.4E	PCN 6		DNSP		PGLd	
24	131114	21.4N 136.4E	PCN 6		DNSP		PGLd	
25	130205	21.4N 136.4E	CONE 2	DNSP		FDFS		
26	130125	21.4N 136.4E	PCN 3	TELE240	Z000.5Z24HRS	DNSP	PGLd	
27	130347	21.4N 136.4E	PCN 3		DNSP		PGLd	
28	170113	21.4N 136.4E	CONE 2	TELE240	Z000.5Z24HRS	DNSP	FDFS	
29	171007	21.4N 136.4E	PCN 6		DNSP		PGLd	
30	171203	21.4N 136.4E	PCN 5		DNSP		PGLd	
31	171538	21.4N 136.4E	PCN 3		DNSP		RPNK	
32	172105	21.4N 136.4E	PCN 5		DNSP		INIT JAS	
33	172105	21.4N 136.4E	PCN 3	TELE240	Z000.5Z24HRS	DNSP	PGLd	
34	172321	21.4N 136.4E	PCN 3	TELE240	Z000.5Z24HRS	DNSP	RNSD	
35	172321	21.4N 136.4E	PCN 3	TELE240	Z000.5Z24HRS	DNSP	PGLd	
36	180100	21.4N 136.4E	PCN 3		DNSP		PGLd	
*	37	181234	21.4N 136.4E	PCN 5		DNSP		PGLd
38	141134	21.4N 136.4E	PCN 4		DNSP		PGLd	
39	141203	21.4N 136.4E	PCN 3		DNSP		PGLd	
40	141203	21.4N 136.4E	PCN 3		DNSP		RNSD	
41	141335	21.4N 136.4E	CONE 2	DNSP		FDFS		
42	141521	21.4N 136.4E	PCN 4		DNSP		PGLd	
43	142229	21.4N 136.4E	PCN 6		DNSP		RDN	
44	162224	21.4N 136.4E	PCN 3		DNSP		RPNK	
45	192303	21.4N 136.4E	PCN 3	T3.0/3.0-01.0/24HRS	DNSP	RNSD		
46	192304	21.4N 136.4E	PCN 3	T3.0/3.0-01.0/24HRS	DNSP	RPNK		
47	192304	21.4N 136.4E	PCN 5	T3.0/2.0	DNSP	INIT JAS	RDN	
48	192304	21.4N 136.4E	PCN 3	T3.0/3.0-01.0/24HRS	DNSP	PGLd		
49	190016	21.4N 136.4E	PCN 3	T3.0/3.0-01.0/24HRS	DNSP	PGLd		
50	190221	21.4N 136.4E	PCN 1		DNSP		RDN	
51	190221	21.4N 136.4E	PCN 1		DNSP		RNSD	
52	190221	21.4N 136.4E	PCN 3		DNSP		RPNK	
53	190221	21.4N 136.4E	PCN 1		DNSP		PGLd	
54	190233	21.4N 136.4E	CONE 1		DNSP		FDFS	
55	191053	21.4N 136.4E	PCN 2		DNSP		PGLd	
56	191109	21.4N 136.4E	PCN 2		DNSP		RDN	
57	191155	21.4N 136.4E	PCN 2		DNSP		RDN	
58	191205	21.4N 136.4E	PCN 1		DNSP		PGLd	
59	191156	21.4N 136.4E	PCN 3		DNSP		RNSD	
60	191503	21.4N 136.4E	PCN 5		DNSP		PGLd	
61	191523	21.4N 136.4E	CONE 1	T3.0/3.0-01.0/24HRS	DNSP	FDFS		
62	192204	31.4N 127.4E	PCN 5	T3.0/3.0-01.0/24HRS	DNSP	RPNK		
63	192206	31.4N 127.4E	PCN 3	T3.0/3.0-01.0/24HRS	DNSP	RNSD		
64	192206	31.4N 127.4E	PCN 5		DNSP		PGLd	
65	200128	31.4N 127.4E	PCN 5		DNSP		PGLd	
66	200203	31.4N 127.4E	PCN 3		DNSP		RNSD	
67	200203	31.4N 127.4E	PCN 6		DNSP		PGLd	
68	201124	31.4N 127.4E	PCN 5		DNSP		RNSD	
69	201129	31.4N 127.4E	PCN 5		DNSP		PGLd	
70	201445	31.4N 127.4E	PCN 6		DNSP		PGLd	

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLR LVL	MIV HGT	MSLP	MAX-SFC-WV0	MAX-FLT-LVL-WND	ACCRY	EYE SHAPE	EYE DIREC-TION	EYE TEMP (C)	WSW NO.
1	160516	21.4N 136.4E	1500FT	000	035	130 075	140 045 130 075	05 05		+26 +26	06	
2	161558	21.4N 136.4E	700MM	1085	1800		140 040 120 140	04 10		+09 +11 +10	05	
3	161720	21.4N 136.4E	700MM									05
4	161935	21.4N 136.4E	700MM									05
5	170235	21.4N 136.4E	700MM	1071	397	030 110 120	240 020 180 020	01 10		+12 +13 +10	05	
6	170936	21.4N 136.4E	700MM	1063	397	020 150 025	140 032 350 020	02 04		+13 +13 +12	07	
7	171047	21.4N 136.4E	700MM	1064	397		040 025 270 030	02 04		+12 +13 +13	07	
8	180322	21.4N 136.4E	700MM	1026	393	035 070 050	150 034 060 140	04 07		+13 +12	08	
9	181657	21.4N 136.4E	700MM	1005	388		140 035 230 070	02 10		+12 +13 +11	09	
10	190241	21.4N 136.4E	700MM	2955	384	040 170 030	270 050 170 030	05 01	CIRCULAR	+10 +13	10	
11	191305	21.4N 136.4E	700MM									11
12	191521	21.4N 136.4E	700MM	2976	387		210 062 120 090	04 05		+14 +16 +11	11	
13	191635	21.4N 136.4E	700MM									11
14	200330	32.4N 128.4E	700MM	1007	992		250 030 190 030	02 10		+18 +13 +11	12	
15	200434	32.4N 128.4E	1500FT	989			000 000 0	02 10		+23 +23	12	

RADAR FIXES

FLX NO.	FLX NO.	FLX POSITION	RADAR ACQRY	EYE SHAPE	FLX DIAM	RADAR-CODE ANWHR TDUFF	COMMENTS	RADAR POSITION	SITE NO. NO.
1	170400	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
2	170430	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
3	171000	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
4	171030	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
5	171100	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
6	171200	24,5N 127,5E LAND	0500	ELLIPTICAL	000			26,5N 127,5E	67091
7	171530	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
8	171550	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
9	171550	24,5N 127,5E LAND	0500	CIRCULAR	010	K11111 111111		26,5N 127,5E	67091
10	171550	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
11	171700	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
12	171700	24,5N 127,5E LAND	0500	CIRCULAR	010	35/13 53210		26,5N 127,5E	67091
13	171730	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
14	171810	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
15	171850	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
16	171900	24,5N 127,5E LAND	0500	CIRCULAR	010	K11111 73210		26,5N 127,5E	67091
17	171930	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
18	172000	24,5N 127,5E LAND	0500	CIRCULAR	010	K11111 73211		26,5N 127,5E	67091
19	172010	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
20	172030	24,5N 127,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
21	172100	24,5N 127,5E LAND	0500	CIRCULAR	010	K11111 73111		26,5N 127,5E	67091
22	172110	24,5N 127,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
23	172200	24,5N 126,5E LAND				K11111 73113		26,5N 127,5E	67091
24	172210	24,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
25	172230	24,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
26	172300	24,5N 126,5E LAND				35/13 53111		26,5N 127,5E	67091
27	172300	24,5N 126,5E LAND				K11111 73012		26,5N 127,5E	67091
28	172310	24,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
29	172330	24,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
30	180005	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
31	180035	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
32	180100	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
33	180110	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
34	180200	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
35	180200	25,5N 126,5E LAND				K11111 72212		26,5N 127,5E	67091
36	180300	25,5N 126,5E LAND				25/13 51904		26,5N 127,5E	67091
37	180300	25,5N 126,5E LAND				K11111 72000		26,5N 127,5E	67091
38	180400	25,5N 126,5E LAND				65/42 50700		26,5N 127,5E	67091
39	180500	25,5N 126,5E LAND				77777 72405		26,5N 127,5E	67091
40	180500	25,5N 126,5E LAND				K11111 50814		26,5N 127,5E	67091
41	180500	25,5N 126,5E LAND				K11111 70000		26,5N 127,5E	67091
42	180555	25,5N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
43	180700	25,5N 126,5E LAND				K11111 53619		26,5N 127,5E	67091
44	180700	25,5N 126,5E LAND				35/11 70514		26,5N 127,5E	67091
45	180800	25,5N 126,5E LAND				K11111 70107		26,5N 127,5E	67091
46	180800	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
47	180830	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
48	180900	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
49	180900	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
50	180900	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
51	180900	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
52	181000	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
53	181000	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
54	181030	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
55	181100	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
56	181100	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
57	181100	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
58	181133	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
59	181200	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
60	181200	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
61	181200	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
62	181300	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
63	181300	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
64	181400	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
65	181435	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
66	181500	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
67	181500	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
68	181500	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
69	181530	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
70	181550	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
71	181550	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
72	181550	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
73	181550	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
74	181552	25,5N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
75	181700	27,1N 126,5E LAND				65/13 63624		26,5N 127,5E	67091
76	181700	27,1N 126,5E LAND				K11111 73611		26,5N 127,5E	67091
77	181703	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
78	181730	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
79	181800	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
80	181800	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
81	181800	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
82	181810	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
83	181830	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
84	181900	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
85	181900	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
86	181910	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
87	181930	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
88	182000	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
89	182000	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
90	182010	27,1N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
91	182030	27,1N 126,5E LAND	0500	CIRCULAR	010			26,5N 127,5E	67091
92	182100	27,1N 126,5E LAND				35/13 71504		26,5N 127,5E	67091
93	182100	27,1N 126,5E LAND				K11111 70000		26,5N 127,5E	67091
94	182110	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
95	182130	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
96	182200	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091
97	182210	27,1N 126,5E LAND	FAIR	CIRCULAR	010			26,5N 127,5E	67091

98	142230	27.4N 126.0E	LAND	PJUR	CIRCULAR	020				26.4N 127.8E	67931
99	142230	27.4N 126.0E	LAND	PJUR	CIRCULAR	020	A//+/+ 7001C	MAX TOP 280		26.4N 127.8E	67931
100	142300	27.4N 126.0E	LAND	PJUR	CIRCULAR	015	A//+/+ 7051C	EYE VFRY DFUS APPRS TO BE FILNG		26.2N 127.8E	67931
101	142330	27.4N 126.0E	LAND	PJUR	CIRCULAR	015	A//+/+ 7051C	SML FEATURES BCHS ILL DEFINED		26.2N 127.8E	67931
102	140000	27.4N 126.3E	LAND	PJUR				MAX TOP 280		26.4N 127.8E	67931
103	140010	27.4N 126.1E	LAND	PJUR				A//+/+ 7350B		26.4N 127.8E	67931
104	140030	27.4N 126.2E	LAND	PJUR				MAX TOP 280		26.4N 127.8E	67931
105	140100	27.4N 126.2E	LAND	PJUR				A//+/+ 7350B		26.2N 127.8E	67931
106	140130	27.4N 126.3E	LAND	PJUR				MAX TOP 360		26.4N 127.8E	67931
107	140200	27.4N 126.3E	LAND	PJUR				A//+/+ 7011C		26.2N 127.8E	67931
108	140210	27.4N 126.4E	LAND	PJUR				A//+/+ 7011C		26.4N 127.8E	67931
109	140230	27.4N 126.1E	LAND					MAX TOP 270		26.4N 127.8E	67931
110	140300	27.4N 126.2E	LAND					A//+/+ 7011C		26.2N 127.8E	67931
111	140330	27.4N 126.1E	LAND					A//+/+ 7350B		26.4N 127.8E	67931
112	140500	24.1N 126.1E	LAND					A//+/+ 5//		26.4N 129.5E	67931
113	140530	24.1N 126.1E	LAND					A//+/+ 7340Y		26.2N 127.8E	67931
114	140530	24.2N 126.1E	LAND					A//+/+ 5021I		26.4N 129.5E	67931
115	140530	24.4N 126.1E	LAND					A//+/+ 7351I		26.2N 127.8E	67931
116	140700	24.4N 126.4E	LAND					A//+/+ 5031B		26.4N 129.5E	67931
117	140500	24.7N 126.4E	LAND					A//+/+ 5351Y		26.4N 129.5E	67931
118	140900	24.8N 126.4E	LAND					A//+/+ 5361U		26.4N 129.5E	67931
119	141000	24.2N 126.4E	LAND					A//+/+ 5300S		26.4N 129.5E	67931
120	141300	24.2N 126.5E	LAND					A//+/+ 5300S		26.4N 129.5E	67931
121	141400	24.2N 126.4E	LAND					A//+/+ 5361L		26.4N 129.5E	67931
122	141500	24.4N 126.4E	LAND					A//+/+ 5331I		26.4N 129.5E	67931
123	141700	24.4N 126.4E	LAND					A//+/+ 5010B		26.4N 129.5E	67931
'24	142000	30.1N 126.4E	LAND	PJUR							

NOV 0270 SHINJISHIKI 67742

TROPICAL STORM ROSE

CATEHITF FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACRY	DVDRAK CODE	SAT	COMMENTS	SITE
1	201445	17.8N 132.0E	PCN 6		DNSP34		PGTM
2	202229	16.6N 131.7E	PCN 5	T1.0/1.0	DNSP34	INIT JHS	RPMK
3	210446	16.3N 130.2E	PCN 5	T1.0/1.0	NOA4S	INIT JHS	PGTM
4	210445	16.3N 129.4E	PCN 6		DNSP34		PGTM
5	210446	16.4N 129.8E	PCN 5		DNSP34		RPMK
6	211124	17.1N 129.2E	PCN 6		NOA4S	CI D044	PGTM
7	220000	18.7N 129.2E	PCN 5	T1.0/1.0 / 50.0/23HRC	NOA4S		PGTM
8	220305	19.6N 129.8E	PCN 5	T1.0/1.0 / 50.0/29HRC	DNSP34	DUAL LOW LVL CIRCULATION EXPOSED	PGTM
9	220309	17.9N 129.1E	PCN 5	T1.0/1.0 / 50.0/29HRC	DNSP34	NO LOW LVL CIRCULATION	RPMK
10	221230	19.5N 126.9E	PCN 6		NOA4S		PGTM
11	221251	16.9N 125.1E	PCN 5		DNSP34		RODN
12	222335	18.4N 126.8E	PCN 5	T2.0/2.0 / 01.0/21HRC	DNSP34		RPMK
13	222335	18.4N 126.8E	PCN 5	T2.0/2.0 / 01.0/24HRC	DNSP34	SECUNDARY 20.5N 125.3E	PGTM
14	230112	18.7N 126.6E	PCN 5		NOA4S		PGTM
15	230252	18.4N 124.5E	PCN 5		DNSP34		PGTM
16	230252	18.4N 123.9E	PCN 5	T2.0/2.0	DNSP34	INIT JHS	RODN
17	230252	18.5N 124.7E	PCN 5		DNSP34		RPMK
18	231133	14.5N 124.1E	PCN 6		DNSP37		RODN
19	231133	19.0N 124.5E	PCN 5		DNSP37		RPMK
20	231152	18.5N 123.7E	PCN 6		NOA4S		PGTM
21	231210	18.5N 124.3E	PCN 6		DNSP34		RODN
22	231210	18.8N 124.2E	PCN 5		DNSP34		RPMK
23	231533	18.7N 123.1E	PCN 5		DNSP34		PGTM
24	232233	21.0N 122.4E	PCN 3		DNSP17		RPMK
25	232319	21.3N 122.6E	PCN 3	T2.5/2.5-/00.5/24HRC	DNSP14		PGTM
26	232319	21.2N 122.5E	PCN 3	T2.0/2.0	DNSP14	INIT JHS	RK50
27	232319	21.2N 122.5E	PCN 3	T2.0/2.0 / 50.0/24HRC	DNSP14		RPMK
28	240028	21.4N 122.5E	PCN 3		NOA4S		PGTM
29	241114	22.7N 122.0E	PCN 5		DNSP37	NO LOW LVL CIRCULATION	RODN
30	241201	22.7N 121.5E	PCN 6		DNSP16		PGTM
31	241515	24.6N 121.8E	PCN 5		DNSP35	NO APPNT LOW LVL CIRCULATION	PGTM
32	241516	24.6N 121.9E	PCN 5		DNSP34	NO APPNT LOW LVL CIRCULATION	RK50

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FLY POSITION	FLY LVL	MIN HGT	OBS MSLP	MAX-SFC-MND VEL/ARG/RNG	MAX-FLT-LVL-DND DTH/VEL/BNG/ING	ACRY NAV/MET	EYE SHAPE	EYE ORIENT-DIM/TATATION	EYE TEMP (C) UHT/ IN/ JP/ SST	MSN NO.
1	220154	18.6N 127.2E	1500FT	1003	30	070 070	140 032 080	080 04 02		+25 +26 +24		01
2	210112	18.7N 124.6E	1500FT	999	65	070 50	150 55 070	30		+26		02
3	230305	18.6N 124.5E	700MB	1039	993	030 090 010	080 045 350	020 05 05	CIRCULAR 10	+18 +15		03
4	231400	18.7N 123.5E	700MB	1006	1004		250 035 190	080 20 20		+10 +10		04
5	232142	20.9N 122.6E	700MB	995	035	310 015	230 030 170	110 02 03		+14 +16		05
6	240959	22.6N 121.8E	700MB	1002	1002	030 160 040	210 040 210	080 02 10		+16 +14 +11		05
7	241140	22.5N 121.8E	700MB	1002			240 31 150	31 31		+13 +13		05

TROPICAL STORM SHIRLEY

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVORAK CODE	SAT	COMMENTS	SITE
1	271249	11.3N 122.8E	PCN 5		NNA4N	UPPER LVL	PGTV
2	272256	11.2N 117.8E	PCN 5		DNSP17		RPMK
3	272351	10.8N 114.0E	PCN 5	T1.0/1.0	DNSP16	INIT JOBS	RPMK
4	280125	9.6N 119.5E	PCN 5	T1.0/1.0	NNA4N	INIT JOBS	PGTV
5	280304	10.1N 119.3E	PCN 5		DNSP15		RPMK
6	241137	10.4N 116.4E	PCN 6		DNSP17	CI 004N	RPMK
7	281205	10.4N 117.1E	PCN 6		NNA4N	CI 004N UPPER LVL	PGTV
8	281546	10.6N 116.0E	PCN 6		DNSP15		RPMK
9	282237	10.3N 118.5E	PCN 5	T1.0/1.0	DNSP17	INIT JOBS SECONDARY 12.2N 115.8E	RODN
10	282333	10.9N 117.7E	PCN 5	T1.0/1.0 /50.0/22HRS	DNSP16		PGTV
11	282334	10.2N 117.4E	PCN 5		DNSP16		RODN
12	290041	10.9N 117.4E	PCN 5		NNA4N		PGTV
13	291118	11.3N 115.3E	PCN 6		DNSP17		RODN
14	291216	11.2N 115.4E	PCN 5		DNSP15	CI SAME	RPMK
15	291528	12.1N 113.4E	PCN 5		DNSP15		PGTV
16	292217	13.2N 111.8E	PCN 3	T2.0/2.0	DNSP17	INIT JOBS	RPMK
17	252218	13.2N 117.5E	PCN 5	T2.0/2.0 /01.0/23HRS	DNSP17		PGTV
18	300410	13.2N 111.0E	PCN 3		DNSP15	BANDING TYPE EYE EST T3.0	RPMK
19	301058	13.6N 109.0E	PCN 3		DNSP17	CI UP	RPMK
20	301059	13.7N 109.4E	PCN 6		DNSP17		RODN
21	301158	13.7N 109.0E	PCN 3		DNSP16		RPMK
22	301159	13.6N 109.4E	PCN 3		DNSP16	CI UP	PGTV
23	301233	13.6N 109.2E	PCN 4		NNA4N		RPMK
24	301652	13.7N 109.4E	PCN 5		DNSP15		PGTV
25	302340	14.0N 107.0E	PCN 5	T1.0/2.0-/W1.0/25HRS	DNSP17		RPMK
26	010110	14.6N 106.4E	PCN 5	T1.0/2.0-/W1.0/26HRS	NNA4N		PGTV
27	010353	14.6N 106.2E	PCN 5		DNSP15	EST T1.0/2.0 LOST IN DROP-OFF	RODN

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYF	RADAR CODE	DIAM ASWAN TDUFF	COMMENTS	RADAR POSITION	SITE	WFO NO.
1	300050	12.3N 112.2E	ACFT						54 WRS			

TYPHOON TRIX

SATELLITE FIXES

FIX NO.	TIME (Z)	POSITION	ACCRY	JVDRAK CODE	SAT	COMMENTS	SITE
1	110005	19.0N 143.6E	PCN 6	TU+0/0+0	DNSP24	INIT OBS	PGT#
2	110108	17.9N 144.1E	PCN 6		NNAA4		PGT#
3	111300	19.6N 141.7E	PCN 5	T1+0/1.0 /01.0/21HRS	DNSP24		PGT#
4	112255	14.5N 141.3E	PCN 6		NNAA4		PGT#
5	120934	20.4N 149.5E	PCN 6		NNAA4		PGT#
6	121012	21.4N 149.7E	PCN 5		DNSP24		PGT#
7	121318	22.3N 149.8E	PCN 6		DNSP24		PGT#
8	122113	23.6N 149.2E	PCN 5	T1+0/1.0 /50.0/24HRS	DNSP24		PGT#
9	130008	21.3N 147.4E	PCN 5		NNAA4		PGT#
10	130201	23.6N 147.4E	PCN 6		DNSP24		PGT#
11	130955	22.6N 140.4E	PCN 6		DNSP24		PGT#
12	131047	21.6N 140.0E	PCN 6		NNAA4	SECONDARY 23.0N 146.4E	PGT#
13	131642	24.0N 145.4E	PCN 6		DNSP24	NU APPNT CC PRML SECUNDARY CC	PGT#
14	132103	24.2N 143.4E	PCN 5		DNSP24		RKS0
15	132109	23.9N 146.5E	PCN 5		DNSP24		PGT#
15	132237	24.2N 147.4E	PCN 5	T2+0/2.0 /01.0/24HRS	DNSP24		PGT#
17	132237	24.0N 143.5E	PCN 5	T2+0/2.0	DNSP24		RKS0
18	132324	23.3N 141.4E	PCN 5		NNAA4		PGT#
19	140143	24.0N 141.2E	PCN 5		DNSP24		PGT#
20	140143	24.5N 143.2E	PCN 5		DNSP24		RKS0
21	140920	24.5N 142.2E	PCN 6		DNSP24		RDN
24	140950	23.7N 142.3E	PCN 6		DNSP24		PGT#
23	141003	23.4N 142.2E	PCN 6		NNAA4		PGT#
24	141119	23.9N 142.2E	PCN 5		DNSP24		PGT#
25	141119	24.0N 142.2E	PCN 5		DNSP24		RKS0
26	141423	23.9N 141.2E	PCN 5		DNSP24		PGT#
27	142049	24.1N 140.5E	PCN 3	T3+0/3.0 /01.0/23HRS	DNSP24		PGT#
28	142049	24.1N 140.4E	PCN 3	T3+0/3.0 /01.0/23HRS	DNSP24		RKS0
29	142220	24.0N 139.9E	PCN 3		DNSP24		RKS0
30	142222	24.1N 140.0E	PCN 3		DNSP24		PGT#
31	150125	24.0N 139.9E	PCN 3		DNSP24		PGT#
32	150930	23.6N 139.3E	PCN 6		DNSP24	CL UP	PGT#
33	150930	23.6N 139.2E	PCN 6		DNSP24		RKS0
34	151102	23.5N 139.2E	PCN 3		DNSP24		PGT#
35	151407	23.4N 139.0E	PCN 5		DNSP24		PGT#
36	152030	22.7N 137.2E	PCN 3		DNSP24		RDN
37	152030	22.9N 137.3E	PCN 1	T4+0/4.0 /01.0/24HRS	DNSP24		PGT#
38	152203	22.5N 137.2E	PCN 3	T4+0/4.0	DNSP24		RDN
39	160107	22.9N 137.7E	PCN 3	T4+0/4.0 /01.0/24HRS	DNSP24		RKS0
40	161044	22.4N 137.8E	PCN 4		DNSP24		RDN
41	162145	22.2N 138.7E	PCN 3		DNSP24		PGT#
42	162152	22.2N 139.4E	PCN 3	T4+0/4.0	DNSP24		RPMK
43	162152	22.0N 139.5E	PCN 3	T4+0/4.0 /50.0/25HRS	DNSP24	INIT OBS	PGT#
44	162307	22.0N 139.8E	PCN 4		NNAA4		PGT#
45	171027	22.7N 139.9E	PCN 6		DNSP24		RDN
46	171027	23.2N 140.2E	PCN 6		DNSP24		PGT#
47	171144	23.2N 140.7E	PCN 6		NNAA4		PGT#
48	172128	23.5N 142.2E	PCN 3	T4+5/4.5 /00.5/24HRS	DNSP24		PGT#
49	172128	23.2N 142.0E	PCN 5	T4+0/4.0	DNSP24	INIT OBS RAGGED EYE	RDN
50	172132	23.6N 142.2E	PCN 1	T5+0/5.0	DNSP24		RKS0
51	180213	24.5N 143.3E	PCN 3		DNSP24	CL DOWN	PGT#
52	180213	24.5N 143.5E	PCN 3		DNSP24		PGT#
53	180213	24.5N 143.4E	PCN 5		DNSP24		RDN
54	180101	25.6N 143.9E	PCN 6		DNSP24		RDN
55	181013	25.3N 144.6E	PCN 5		DNSP24		RPMK
56	181013	25.3N 144.6E	PCN 5		DNSP24	CL DOWN	PGT#
57	181100	25.7N 141.5E	PCN 5		NNAA4		PGT#
58	181316	25.6N 145.2E	PCN 5		DNSP24		PGT#
59	181455	25.5N 145.7E	PCN 5		DNSP24		PGT#
60	182110	25.2N 145.5E	PCN 3	T5+0/5.0 /00.5/24HRS	DNSP24		PGT#
61	182111	25.7N 145.4E	PCN 6	T5+0/5.0 /01.0/24HRS	DNSP24		RDN
62	182112	25.4N 145.7E	PCN 3	T5+0/5.0 /50.0/24HRS	DNSP24		RKS0
63	182336	25.8N 146.2E	PCN 3		NNAA4		PGT#
64	190156	26.0N 145.6E	PCN 3		DNSP24		RKS0
65	190159	26.5N 146.1E	PCN 3		DNSP24		PGT#
66	190954	27.5N 144.8E	PCN 6		DNSP24		RDN
67	190954	27.0N 145.0E	PCN 3		DNSP24		RKS0
68	191018	27.0N 145.5E	PCN 5		NNAA4		PGT#
69	191437	27.7N 145.2E	PCN 3		DNSP24	CL UP	PGT#
70	192053	26.9N 144.0E	PCN 3	T3+5/4.5 /W1.5/24HRS	DNSP24		PGT#
71	192053	29.0N 143.8E	PCN 3	T4+0/4.0 /W1.5/24HRS	DNSP24		RKS0
72	192235	29.0N 143.4E	PCN 3		DNSP24	UPR LVL 29.5N 143.3E	PGT#
73	192252	29.2N 143.6E	PCN 6		NNAA4		PGT#
74	200138	29.2N 143.2E	PCN 3		DNSP24		PGT#
75	200934	29.9N 141.0E	PCN 6		DNSP24		PGT#
76	200934	30.6N 140.9E	PCN 6		DNSP24	LOW LVL CIRC ON CU LINE	RDN
77	201117	30.1N 139.8E	PCN 5		NNAA4		PGT#
78	201128	29.5N 140.0E	PCN 6		NNAA4		PGT#
79	201619	29.5N 139.2E	PCN 6		DNSP24		PGT#
80	202034	29.7N 139.0E	PCN 5		DNSP24		PGT#
81	202218	29.4N 136.7E	PCN 5	T2+5/2.5	DNSP24	INIT OBS	RDN
82	202218	30.2N 137.9E	PCN 5	T3+0/4.0 /W1.0/24HRS	DNSP24		RKS0
83	202218	30.1N 137.9E	PCN 5	T2+0/3.0 /W1.5/24HRS	DNSP24		PGT#
84	210005	30.5N 137.0E	PCN 3		NNAA4		PGT#
85	210120	30.4N 137.2E	PCN 5		DNSP24	EXPPOSED LOW LVL CIRC	RKS0

85	211054	29.2N 131.1E	PCN 5		DNSP1A		POTd
87	211100	30.4N 131.7E	PCN 5		DNSP1A		RNSO
88	211401	24.7N 132.9E	PCN 5		DNSP1A		POTd
89	211534	24.4N 133.2E	PCN 5		DNSP1A		RDN
90	212156	29.1N 130.5E	PCN 5	T2.0/2.0 /S0.0/24HRS	DNSP1T		POTd
91	212201	29.2N 130.8E	PCN 5	T2.0/2.0 /W1.0/24HRS	DNSP1A		RNSO
92	220117	24.4N 129.4E	PCN 5		NNNN		POTd
93	220249	24.5N 129.5E	PCN 5	T2.0/2.0 /W0.5/24HRS	DNSP1A		RDN
94	230244	24.4N 127.2E	PCN 5		DNSP1A		RNSO
95	231035	24.5N 129.0E	PCN 5		DNSP1T		POTd
96	221037	24.4N 129.0E	PCN 5		DNSP1T		RNSO
97	221156	24.1N 124.7E	PCN 5		NNNN		POTd
98	221226	27.4N 124.8E	PCN 5		DNSP1A	BASED ON CI RANDING	RDN
99	221252	26.4N 124.1E	PCN 5		DNSP1A		POTd
100	222137	29.2N 121.1E	PCN 3	T1.0/2.0 /W1.0/24HRS	DNSP1T		POTd
101	222137	29.2N 121.1E	PCN 5	T1.0/2.0 /W1.0/19HRS	DNSP1T		RDN
102	230033	29.2N 121.3E	PCN 5		NNNN		POTd

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	HGT	NSP	MAX-SFC-W40	MAX-FLT-LVL-ENO	ACCRY	EYE SHAPE	EYE ORIEN- GATION	EYE TEMP. (C)	NSV NO.
1	131549	23.4N 130.1E	700MM	1080	1003	35 330 50	070 27 330 90	04 05		+10 +10		2
2	140105	23.6N 143.1E	700MM			095 035 340 045	070 027 340 045	04 02		+16 +15		3
3	150338	23.4N 132.9E	700MM	1041	004	200 038 100 010	02 02			+11 +13 +12		4
4	141643	23.9N 141.2E	700MM	1002	092		230 65 030 30			+17		5
5	150309	23.4N 130.6E	700MM	2066		100 050 10	230 040 040 040	10 05	CIRCULAR	15	+10 +17	6
6	150345	23.4N 130.3E	700MM	>927	980	040 140 010	040 065 300 040			+17		7
7	150550	23.4N 130.3E	700MM	>927		80 140 10	230 057 140 15			+10 +17		8
8	151159	23.4N 130.1E	700MM	2335			060 58 340 30			+20		9
9	151506	23.2N 134.0E	700MM	>966	980	040 045 290 075	05 05			+13 +20		10
10	160030	22.9N 137.8E	700MM	>867	973	050 120 010	230 071 140 018	01 03	CIRCULAR	15	+12 +17	11
11	160326	22.7N 117.7E	700MM	>852	970	050 120 020	040 065 300 025	03 03	CIRCULAR	18	+10 +16	12
12	161221	22.1N 130.1E	700MM	>881			200 75 100 10			+18		13
13	161509	22.0N 130.1E	700MM	>876	974		200 070 110 020	05 02	CIRCULAR	20	+12 +16	14
14	170132	27.0N 130.3E	700MM	>834		70 180 25	270 75 180 25			+17 +17		15
15	170435	29.6N 134.0E	700MM	>824	067	065 170 025	270 072 170 025	03 00	CIRCULAR	25	+15 +21 +19	16
16	171410	29.4N 140.8E	700MM	2042			200 50 090 30			+20		17
17	171530	29.4N 141.3E	700MM	>839	980		200 050 120 025	04 04		+11 +17 +17		18
18	180317	24.1N 143.7E	700MM	>911						+16 +11		19
19	180435	24.2N 143.9E	700MM	>909	980	045 180 030	250 050 180 030	02 10		+16 +16 +16		20
20	190330	24.4N 146.1E	700MM	1001	988	050 270 030	240 040 180 045	03 05		+11 +17		21
21	190506	26.6N 146.4E	700MM	2012	084	055 250 010	140 060 080 030	02 01		+01 +25	27	22
22	191305	27.4N 145.3E	700MM				140 53 090 50			+16 +13		23
23	191542	24.0N 144.8E	700MM	2976			110 050 020 040	03 04		+16 +17 +15		24
24	200254	29.1N 141.0E	700MM	1043	996	035 070 060	140 040 070 035	03 05		+16 +16	26	25
25	201520	29.6N 139.3E	700MM	1070	1000		050 039 290 042	10 05		+16 +16 +11		26
26	210305	29.4N 136.5E	700MM		1000	025 360 025	140 025 360 025	03 10		+04 +25 +24	29	27
27	211529	27.1N 131.6E	700MM	1104	1003		140 025 280 010	02 15				28
28	220000	29.0N 129.1E	1500FT		1000							29
29	220350	24.7N 127.7E	1500FT		097	055 100 015	140 035 080 080	05 05	CIRCULAR	08	+06 +26	27

TYPHOON VIRGINIA

SATELLITE FIXES

FIX NU. (Z)	TIME	FIX POSITION	ACCRY	Dvorak Code	SAT	COMMENTS	SITE
1	222237	16.3N 151.0E	PCN 5	T0+0/0.0	NNAAS	INIT DRS	PGTH
2	230044	16.2N 151.3E	PCN 5		DNSP35		PGTH
3	231025	16.1N 150.7E	PCN 5		DNSP36	CI UP	PGTH
4	231025	16.4N 148.5E	PCN 4		DNSP36		RODN
5	231326	16.1N 151.1E	PCN 6		DNSP36		PGTH
6	231326	13.9N 150.8E	PCN 6		DNSP36	SECONDARY 15.4N 152.1E	RODN
7	232125	16.3N 151.9E	PCN 5	T2+0/2.0 /D2+0/23HRS	DNSP36		PGTH
8	240027	16.3N 151.5E	PCN 5		DNSP36		PGTH
9	241009	17.3N 151.2E	PCN 6		DNSP36		PGTH
10	241305	18.1N 151.2E	PCN 6		DNSP36		PGTH
11	242109	18.5N 150.5E	PCN 5		DNSP36		PGTH
12	242305	18.7N 150.4E	PCN 5		DNSP36		PGTH
13	250150	18.3N 150.3E	PCN 5		DNSP36		PGTH
14	250340	20.0N 149.6E	PCN 5		DNSP37		PGTH
15	250400	19.5N 150.7E	PCN 5		DNSP37		RODN
16	251251	20.4N 149.5E	PCN 6		DNSP37		PGTH
17	252035	20.4N 149.2E	PCN 5	T4+0/4.0 /D1+0/24HRS	DNSP37		PGTH
18	252035	20.3N 149.4E	PCN 5	T4+0/4.0	DNSP37	INIT DRS	RODN
19	26n132	21.2N 148.9E	PCN 6		DNSP37		PGTH
20	26n319	21.4N 147.4E	PCN 5		DNSP37		PGTH
21	26n319	21.3N 148.4E	PCN 6		DNSP37		RODN
22	261416	21.4N 147.8E	PCN 5		DNSP37	UPR LVL CDO	PGTH
23	262213	21.5N 148.1E	PCN 5		DNSP37	CI DRS	PGTH
24	262215	21.9N 148.0E	PCN 3		DNSP37		RPMK
25	270114	21.5N 147.0E	PCN 5		DNSP37		PGTH
26	270115	21.5N 147.1E	PCN 5		DNSP37		RODN
27	270300	21.4N 147.4E	PCN 4		DNSP37		RODN
28	270300	21.5N 147.4E	PCN 4		DNSP37		PGTH
29	271057	21.4N 146.9E	PCN 4		DNSP37		PGTH
30	271357	21.7N 147.2E	PCN 5		DNSP37		PGTH
31	271359	21.2N 147.2E	PCN 5	T5+0/5.0 /D1+0/24HRS	DNSP37		PGTH
32	272128	21.7N 147.4E	PCN 5	T3+5/3.5	DNSP36	INIT DRS	RKSO
33	272159	21.3N 147.5E	PCN 5		DNSP36		PGTH
34	280055	21.4N 147.7E	PCN 5		DNSP36		PGTH
35	280340	22.2N 147.4E	PCN 6		DNSP37	CI CDRN	PGTH
36	281040	22.2N 147.2E	PCN 4		DNSP36		RODN
37	281040	22.1N 147.2E	PCN 5		DNSP36		PGTH
38	281339	22.0N 146.6E	PCN 6		DNSP36		PGTH
39	281357	21.7N 147.9E	PCN 5		DNSP35		RODN
40	282121	22.3N 146.9E	PCN 3		DNSP37		RPMK
41	282121	22.7N 147.0E	PCN 3		DNSP37		RKSO
42	282141	22.2N 146.7E	PCN 3	T4+0/4.0	DNSP36	INIT DRS	RODN
43	282141	22.3N 147.2E	PCN 3	T4+5/5.0-/W0+5/26HRS	DNSP36		PGTH
44	290039	22.3N 147.3E	PCN 4		DNSP35		PGTH
45	291002	24.0N 147.3E	PCN 4		DNSP37		RKSO
46	291002	23.9N 146.8E	PCN 4		DNSP37		PGTH
47	291022	23.9N 146.6E	PCN 4		DNSP36		PGTH
48	291023	24.1N 146.6E	PCN 6		DNSP36		RODN
49	291320	24.0N 146.5E	PCN 4		DNSP35		PGTH
50	292102	25.0N 145.0E	PCN 3		DNSP37		RKSO
51	292102	25.3N 145.0E	PCN 3	T4+0/4.0 /S0+0/24HRS	DNSP37		RODN
52	292124	25.0N 145.1E	PCN 3	T4+5/4.5 /S0+0/24HRS	DNSP36		PGTH
53	300203	25.3N 144.7E	PCN 3	T4+0/4.0	DNSP35		RPMK
54	300203	25.4N 144.4E	PCN 4		DNSP35		RKSO
55	300203	25.4N 144.4E	PCN 4		DNSP35		PGTH
56	300943	27.1N 143.9E	PCN 6		DNSP37		RODN
57	30n943	27.1N 143.9E	PCN 4		DNSP37		PGTH
58	301005	27.1N 143.7E	PCN 4		DNSP36		PGTH
59	301444	27.5N 143.6E	PCN 4		DNSP35		PGTH
60	301445	27.5N 143.6E	PCN 5		DNSP35		RKSO
61	302043	28.7N 143.0E	PCN 3	T3+0/4.0 /W1+0/24HRS	DNSP37		RODN
62	302043	28.4N 142.8E	PCN 1	T3+5/4.5 /W1+0/24HRS	DNSP37		PGTH
63	302106	28.4N 142.9E	PCN 3		DNSP36		PGTH
64	310145	30.2N 142.8E	PCN 3	T3+5/4.0 /W0+5/24HRS	DNSP35		RKSO
65	310145	30.3N 142.8E	PCN 3		DNSP35		PGTH
66	310223	31.3N 141.9E	PCN 6		DNSP37		RODN
67	310223	31.3N 141.8E	PCN 4		DNSP37		PGTH
68	311129	31.3N 141.8E	PCN 4		DNSP36		PGTH
69	311126	32.3N 141.6E	PCN 3		DNSP35		PGTH
70	311427	32.5N 141.7E	PCN 3		DNSP35		RPMK
71	311427	32.4N 142.0E	PCN 3		DNSP35		RKSO
72	312023	33.3N 141.5E	PCN 1	T3+0/4.0-/W0+5/24HRS	DNSP37		PGTH
73	312231	33.3N 141.5E	PCN 3		DNSP36		PGTH
74	312346	33.4N 141.1E	PCN 3		NNAAS		PGTH
75	010127	34.1N 141.6E	PCN 3	T3+0/3.5-/W0+5/24HRS	DNSP35		RKSO
76	010127	34.1N 141.6E	PCN 3		DNSP35		PGTH
77	010304	35.4N 142.0E	PCN 6		DNSP37		RODN
78	010304	35.2N 141.1E	PCN 3		DNSP37		PGTH
79	011045	36.5N 142.3E	PCN 4		DNSP37	CI SAME	PGTH
80	011112	36.4N 142.5E	PCN 3		DNSP36		RKSO
81	011140	36.4N 143.0E	PCN 3		DNSP35		PGTH
82	012004	34.5N 144.0E	PCN 5	T2+0/2.0	DNSP37		RODN
83	012004	37.7N 143.9E	PCN 5		DNSP37		PGTH
84	012213	34.7N 144.1E	PCN 5	T3+0/4.0-/S0+0/24HRS	DNSP36		PGTH
85	012213	34.9N 144.3E	PCN 5	T2+0/3.0-/W1+0/24HRS	DNSP36		RKSO
86	012302	34.8N 144.3E	PCN 5		NNAAS		PGTH
87	020342	40.1N 147.9E	PCN 6		NNAAS		PGTH
88	021026	40.5N 148.2E	PCN 5		DNSP37		RKSO
89	021026	40.4N 148.6E	PCN 6		DNSP37		RODN
90	021055	40.4N 148.6E	PCN 5		DNSP36		RKSO
91	030015	41.5N 150.4E	PCN 5		NNAAS		PGTH

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	4IV AGF	2HS MSLP	MAX-SFC-HD VEL/3RG/RNG	MAX-FLT-LVL-HD DTH/VEL/3RG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE ORIEN- GATION	EYE TEMP. (C) OUT/ IN/ JP/KST	MSP NO.
1	230515	15.4N 151.0E	1500FT	294	55 290	45 350	65 290	45 350	CIRCULAR	60	+26 +26 +26 26	1
2	230205	15.4N 151.1E	700MH	3027	293	75 240	5 310	65 340	20 450	4 5	+13 +21 +11	2
3	241135	15.7N 151.0E	700MH	3054	120 050	20 150	50 050	20 150	4 5	+18 +4	2	
4	240325	15.4N 151.0E	700MH	3025	287	55 260	10 160	70 120	15 450	4 5	+15 +15 +4	2
5	241325	15.7N 151.0E	700MH	2945	282	160 50 050	30 700	65 700	60 60	4 5	+9 +19	3
6	251130	15.0N 150.7E	700MH	2935	30 700	20 160	65 700	60 60	4 5	+18 +11	4	
7	251425	14.5N 150.2E	700MH	2885	274	70 130	10 220	60 130	10 5 5	CIRCULAR 60	+15 +21 +12	4
8	251545	20.1N 149.7E	700MH	2954	120	65 400	30 200	65 400	30 190	4 5	+19	5
9	251500	20.4N 149.3E	700MH	2894	277	200 30 180	24 300	55 250	40 7 5	ELLIPICAL 60 25 140	+12 +16	5
10	260107	21.1N 149.3E	700MH	2912	281	35 210	22 300	55 250	40 7 5	+10 +17 +13	5	
11	261205	21.4N 149.3E	700MH	2921	20 340	15 060	75 340	50 50	4 5	+17 +13	5	
12	261225	21.4N 149.3E	700MH	2964	040	45 050	30 040	45 050	30 190	4 5	+19 +11	7
13	261512	21.7N 147.7E	700MH	2942	3H2	360 70 270	30 3 5	360 70 270	30 3 5	+15 +18 +11	7	
14	271040	21.4N 147.6E	700MH	2947	20 020	70 110	65 020	30 30	4 5	+16 +12	9	
15	271235	21.4N 147.3E	700MH	2945	3H7	130 340	30 060	55 340	30 4 5	+13 +17 +11	8	
16	281121	21.4N 147.6E	700MH	2912	60 030	120 040	30 030	120 040	4 5	+16 +13	9	
17	281139	21.4N 147.9E	700MH	2911	279	30 280	120 010	60 260	60 3 5	+15 +17 +11	9	
18	281330	21.4N 147.1E	700MH	2905	3H0	270 60 210	36 5 3	270 60 210	36 5 3	+12 +15 +13	10	
19	281302	22.2N 147.1E	700MH	2884	277	020 52 110	95 5 3	020 52 110	95 5 3	+13 +14 +13	10	
20	290715	22.7N 147.1E	700MH	2923	50 320	40 060	50 320	70 70	4 5	+15 +13	11	
21	291011	22.8N 146.9E	700MH	2915	3H2	50 090	50 350	65 090	60 4 10	+13 +15 +12	11	
22	291553	24.5N 146.7E	700MH	2933	283	130 55 030	80 0	130 55 030	80 0	+14 +12	12	
23	301112	25.5N 146.7E	700MH	2944	50 140	58 200	55 140	68 6 4	+13 +16 +12	12		
24	300542	25.2N 146.7E	700MH	2934	65 100	58 340	40 100	68 5 5	+12 +13 +12	13		
25	301715	24.8N 146.1E	700MH	2954	3H4	240 48 180	60 25 5	240 48 180	60 25 5	+12 +12	14	
26	310230	10.7N 142.7E	700MH	2937	55 210	50 320	40 220	72 3 1	+13 +14 +13	15		
27	310523	38.5N 147.0E	700MH	2925	55 060	120 180	63 060	77 77	4 5	+13 +13	15	
28	311514	38.4N 147.0E	700MH	2944	3H3	180 57 100	68 5 5	180 57 100	68 5 5	+13 +13 +12	16	
29	311523	37.3N 141.7E	700MH	2932	160 75 090	80 0	160 75 090	80 0	+12 +12	16		
30	312342	37.1N 141.7E	700MH	2936	3H2	45 170	35 260	67 170	65 5 5	+12 +13 +11	15	
31	010330	33.4N 141.7E	700MH	2907	50 200	25 240	50 190	70 5 2	+14 +15 +12	17		
32	010235	34.0N 141.7E	700MH	2905	978	160 55 060	60 5 3	160 55 060	60 5 3	+13 +15 +11	17	
33	011515	36.2N 142.7E	700MH	2931	3H1	320 60 240	40 2 5	ELLIPICAL 65 20 030	+13 +14	18		
34	011731	37.3N 143.3E	700MH	2926	280 55 200	120 0	280 55 200	120 0	+14	18		

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYF SHAPE	EYF DIAM	RADAR-CODE ASWAK TDFF	COMMENTS	RADAR POSITION	SITE WMO NO.
1	312130	33.4N 141.3E	LAND	6100	25		NOV 3A20 MINEOKA		35.2N 140.1E	
2	312230	33.5N 141.4E	LAND	6100	25		NOV 3A20 MINEOKA		35.2N 140.1E	
3	312300	33.4N 141.5E	LAND	6100	25		NOV 3A20 MINEOKA		35.2N 140.1E	
4	010000	33.4N 141.5E	LAND	6100	25		NOV 3A20 MINEOKA		35.2N 140.1E	
5	010100	33.2N 141.5E	LAND	6100	25		NOV 3A20 MINEOKA		35.2N 140.1E	
6	010230	34.0N 141.5E	LAND	6100	30		NOV 3A10 MINEOKA		35.2N 140.1E	
7	010300	34.2N 141.5E	LAND	6100	25		NOV 0110 MINEOKA		35.2N 140.1E	
8	010300	34.1N 141.5E	LAND	6100	21401	//////			35.8N 139.8E	67562
9	010335	34.1N 141.5E	LAND	P1UR	25		NOV 3A15 MINEOKA		35.7N 139.3E	67562
10	010600	34.1N 141.5E	LAND	6100	25		NOV 0440 MINEOKA		35.2N 140.1E	
11	010610	34.1N 141.5E	LAND	P1UR	25		NOV 0430 MINEOKA		35.7N 139.3E	67562
12	010445	34.2N 141.5E	LAND	P1UR	25		NOV 0430 MINEOKA		35.7N 139.3E	67562
13	010500	34.5N 141.5E	LAND	6100	25		NOV 0430 MINEOKA		35.2N 140.1E	
14	010510	34.2N 141.5E	LAND	P1UR	25		NOV 0430 MINEOKA		35.7N 139.3E	67562
15	010533	34.3N 141.5E	LAND	P1UR	25		NOV 0430 MINEOKA		35.2N 140.1E	
16	010500	34.4N 141.5E	LAND	6100	30		NOV 0440 MINEOKA		35.8N 139.8E	67562
17	010510	34.5N 141.5E	LAND	P1UR	25		NOV 0430 MINEOKA		35.7N 139.3E	67562
18	010533	34.4N 141.5E	LAND	P1UR	25		NOV 0430 MINEOKA		35.7N 139.3E	67562
19	010700	34.2N 141.5E	LAND	6100	45		NOV 3A20 MINEOKA		35.2N 140.1E	
20	010700	35.0N 141.5E	LAND	6100	21942	70120			35.8N 139.8E	67562
21	010710	34.7N 141.5E	LAND	P1UR	25		NOV 3A20 MINEOKA		35.7N 139.3E	67562
22	010735	34.4N 141.5E	LAND	P1UR	25		NOV 3A20 MINEOKA		35.7N 139.3E	67562
23	010535	35.2N 142.2E	LAND	P1UR	21922	70319			35.8N 139.8E	67562
24	010400	35.5N 142.2E	LAND	P1UR	21922	70319			35.7N 139.3E	67562
25	010910	35.4N 142.3E	LAND	P1UR	21922	50111			35.8N 139.8E	67562
26	010935	35.1N 142.4E	LAND	P1UR	21922	50114			35.7N 139.3E	67562
27	011000	35.4N 142.3E	LAND	P1UR	21922	50114			35.8N 139.8E	67562
28	011010	35.4N 142.4E	LAND	P1UR	21912	50115			35.7N 139.3E	67562
29	011030	36.0N 142.4E	LAND	P1UR	21912	50216			35.7N 139.3E	67562
30	011100	35.4N 142.4E	LAND	P1UR	21912	50216			35.8N 139.8E	67562
31	011110	34.6N 142.3E	LAND	P1UR	22012	70315			35.7N 139.3E	67562
32	011200	34.1N 142.4E	LAND	P1UR	21912	50217			35.8N 139.8E	67562
33	011210	36.3N 142.5E	LAND	P1UR	21912	50222			35.7N 139.3E	67562
34	011230	36.4N 142.5E	LAND	P1UR	21912	50227			35.7N 139.3E	67562
35	011300	36.1N 142.5E	LAND	P1UR	22012	70315			35.8N 139.8E	67562
36	011500	36.4N 142.6E	LAND	65/41	70110				35.8N 139.8E	67562
37	011500	36.7N 142.5E	LAND	65/11	50111				38.3N 140.9E	67590
38	011500	37.0N 142.7E	LAND	65/11	50216				38.3N 140.9E	67590
39	011700	37.4N 143.2E	LAND	65/11	50432				38.3N 140.9E	67590
40	011900	37.7N 143.3E	LAND	65/11	50222				38.3N 140.9E	67590
41	011900	39.4N 143.7E	LAND	65/11	50327				38.3N 140.9E	67590
42	012000	38.5N 144.1E	LAND	65/11	50327				38.3N 140.9E	67590

TYphoon Wendy

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACRY	UVTRAK CODE	SAT	COMMENTS	SITE
1	222137	21.4N 117.4E	PCN 3	T1+0/1.0	DNSP17		PGLW
2	231018	21.4N 117.1E	PCN 5		DNSP17	CI UP	PGLW
3	231508	22.0N 117.0E	PCN 6		DNSP17		PGLW
4	211309	21.4N 116.8E	PCN 3		DNSP17		ROON
5	212117	21.4N 116.1E	PCN 5	T3+0/3.0 /02.0/26HRS	DNSP17		PGLW
6	232308	21.4N 116.5E	PCN 5		DNSP17		PGLW
7	232369	21.3N 116.1E	PCN 5		DNSP17		PGLW
8	260208	21.1N 116.0E	PCN 3		DNSP17		PGLW
9	260358	21.1N 115.9E	PCN 5		DNSP17	CI UP	PGLW
10	260458	20.5N 115.9E	PCN 5		DNSP17		RKSD
11	241149	20.9N 115.8E	PCN 5		DNSP17		PGLW
12	241149	20.5N 115.8E	PCN 5		DNSP17		RKSD
13	241150	20.7N 115.8E	PCN 5		DNSP17		PGLW
14	241150	20.0N 115.5E	PCN 5		DNSP17		RKSD
15	242250	21.7N 115.8E	PCN 1	T5+0/5.0	DNSP17	INIT JDS	ROON
16	242058	21.7N 115.8E	PCN 1	T9+5/4.5 /01.5/26HRS	DNSP17		PGLW
17	242250	20.9N 115.9E	PCN 3	T9+0/4.0	DNSP17	INIT JDS	RPMK
18	242250	21.9N 115.4E	PCN 5	T9+5/4.5	DNSP17	INIT JDS	RKSD
19	242305	20.8N 115.8E	PCN 3		DNSP17		PGLW
20	250150	20.8N 115.7E	PCN 5		DNSP17		PGLW
21	250150	20.5N 115.2E	PCN 5		DNSP17		RKSD
22	250233	21.1N 115.3E	PCN 5		DNSP17		RKSD
23	250439	21.3N 115.3E	PCN 5		DNSP17	CI SAME	ROON
24	250439	21.1N 115.1E	PCN 5		DNSP17	CI SAME	PGLW
25	251132	21.0N 115.4E	PCN 5		DNSP17		PGLW
26	251132	21.1N 114.0E	PCN 3		DNSP17		RKSD
27	251132	21.0N 113.4E	PCN 5		DNSP17		PGLW
28	252232	21.5N 114.0E	PCN 5	T5+0/5.0 /00.5/26HRS	DNSP17		PGLW
29	252232	21.5N 114.0E	PCN 5	T5+0/5.0 /00.5/26HRS	DNSP17		PGLW
30	252233	21.6N 114.1E	PCN 3	T5+0/5.0 /00.5/26HRS	DNSP17		RKSD
31	252233	21.0N 114.2E	PCN 3	T9+0/4.0 /50.0/26HRS	DNSP17		RPMK
32	260017	21.4N 115.8E	PCN 5		DNSP17	BASED JN EXTRAP CB BAND BANDING TYPE EYE	PGLW
33	260132	21.7N 115.3E	PCN 5		DNSP17		RKSD
34	260132	21.5N 115.4E	PCN 5		DNSP17		PGLW
35	260919	22.2N 115.0E	PCN 6		DNSP17		ROON
36	260919	22.3N 112.9E	PCN 6		DNSP17		PGLW
37	241101	22.3N 112.9E	PCN 6		DNSP17		PGLW
38	241101	22.6N 111.2E	PCN 2		DNSP17		RKSD
39	261115	22.6N 112.9E	PCN 2		DNSP17		ROON
40	261115	22.3N 112.8E	PCN 5		DNSP17		PGLW
41	261514	27.4N 112.8E	PCN 3		DNSP17		PGLW
42	262200	21.1N 112.9E	PCN 1	T5+0/5.0+/50.0/26HRS	DNSP17		RKSD
43	262200	21.2N 112.8E	PCN 1	T5+0/5.0+/50.0/26HRS	DNSP17		PGLW
44	262215	23.3N 112.9E	PCN 1		DNSP17		PGLW
45	262215	23.2N 112.9E	PCN 1	T4+0/4.0+/50.0/26HRS	DNSP17		RPMK
46	270115	23.2N 112.6E	PCN 5		DNSP17		RKSD
47	270115	23.0N 112.4E	PCN 5		DNSP17		ROON
48	271041	26.3N 113.1E	PCN 2		DNSP17		PGLW
49	271041	26.4N 111.9E	PCN 1		DNSP17		RPMK
50	271057	26.4N 111.8E	PCN 6		DNSP17		ROON
51	271057	26.3N 111.6E	PCN 2		DNSP17		PGLW
52	271530	26.4N 111.1E	PCN 6		DNSP17		PGLW
53	271538	26.7N 111.1E	PCN 6		DNSP17		RPMK
54	272140	25.7N 110.3E	PCN 3	T5+0/5.0 /50.0/26HRS	DNSP17		PGLW
55	272158	25.7N 110.6E	PCN 3	T5+0/5.0 /50.0/26HRS	DNSP17		RKSD
56	272340	26.2N 129.9E	PCN 3		DNSP17		RKSD
57	280045	26.7N 129.8E	PCN 3		DNSP17		PGLW
58	280234	26.5N 129.8E	PCN 6		DNSP17		PGLW
59	280239	26.9N 129.4E	PCN 1		DNSP17		RKSD
60	280239	26.8N 129.3E	PCN 3	T5+5/5.5	DNSP17		ROON
61	280239	26.9N 129.1E	PCN 3	T3+0/4.0 /W1.0/26HRS	DNSP17		RPMK
62	281022	27.3N 127.6E	PCN 6		DNSP17	CI SAME	PGLW
63	241022	27.4N 127.7E	PCN 2		DNSP17	CI SAME	RKSD
64	241222	27.7N 127.3E	PCN 6		DNSP17		ROON
65	241222	28.0N 127.2E	PCN 2		DNSP17		RKSD
66	281222	27.8N 127.8E	PCN 6		DNSP17		RPMK
67	281520	27.8N 126.7E	PCN 6		DNSP17		PGLW
68	282121	28.2N 126.2E	PCN 1	T4+0/5.0-/W1.0/26HRS	DNSP17		PGLW
69	282121	28.1N 126.2E	PCN 1	T4+0/5.0-/W1.0/26HRS	DNSP17		RKSD
70	282121	28.1N 126.2E	PCN 1	T3+5/3.5 /50.0.5/10HRS	DNSP17		RPMK
71	282323	28.3N 126.1E	PCN 1		DNSP17		PGLW
72	282323	28.1N 126.0E	PCN 1		DNSP17		RPMK
73	291002	28.7N 126.0E	PCN 6		DNSP17		PGLW
74	291002	29.1N 125.8E	PCN 3		DNSP17		RKSD
75	291145	29.3N 125.5E	PCN 6		DNSP17		RPMK
76	291206	29.2N 125.6E	PCN 2		DNSP17		RKSD
77	291206	29.2N 125.7E	PCN 6		DNSP17		PGLW
78	291502	29.5N 125.4E	PCN 6		DNSP17		PGLW
79	292102	29.0N 125.0E	PCN 5		DNSP17		PGLW
80	292102	29.4N 125.3E	PCN 2	T4+0/4.0-/50.0/26HRS	DNSP17		RKSD
81	292102	29.4N 125.1E	PCN 3		DNSP17		ROON
82	292243	29.4N 125.3E	PCN 6		DNSP17		RKSD
83	292243	29.4N 125.2E	PCN 3		DNSP17		RPMK
84	292305	29.9N 125.3E	PCN 3	T4+5/4.5-/50.0/26HRS	DNSP17		PGLW
85	292305	29.9N 125.1E	PCN 3	T4+5/4.5-/50.0/26HRS	DNSP17		RPMK
86	300202	29.9N 125.1E	PCN 3		DNSP17		RPMK
87	300203	30.0N 125.3E	PCN 1		DNSP17		RKSD
88	300203	30.1N 125.0E	PCN 2		DNSP17		PGLW
89	301124	30.4N 125.5E	PCN 6		DNSP17		ROON
90	301147	30.5N 124.8E	PCN 6		DNSP17		PGLW
91	301147	30.6N 125.0E	PCN 3		DNSP17		RKSD
92	301147	30.6N 124.7E	PCN 3		DNSP17		PGLW
93	301145	30.3N 124.5E	PCN 3		DNSP17		RKSD
94	301526	30.3N 124.9E	PCN 3		DNSP17		RKSD

92	310505	30.4N 124.1E	PCN 3	DNSP15		RPMK
93	302229	30.4N 124.0E	PCN 4	DNSP15		RPMK
97	302249	30.4N 124.7E	PCN 3	T1.0/2.0 /W1.5/24HRS	DNSP15	PG14
98	302249	30.4N 124.4E	PCN 3	T1.0/2.0	DNSP15	R004
99	310455	30.4N 124.8E	PCN 3	T1.0/2.0 /W1.0/24HRS	DNSP15	RKSD
100	310455	30.4N 124.5E	PCN 4	DNSP15		PG14
101	310327	30.4N 124.8E	PCN 3	DNSP15		RKSD
102	311105	30.4N 124.4E	PCN 4	DNSP15		RKSD
103	311105	30.4N 124.4E	PCN 4	DNSP15		R004
104	311105	30.4N 124.4E	PCN 3	DNSP15		RPMK
105	311129	30.4N 124.7E	PCN 4	DNSP15		PG14
106	311205	30.4N 124.4E	PCN 3	T1.5/3.5	DNSP15	RPMK
107	311509	30.4N 124.0E	PCN 3	DNSP15		RPMK
108	311509	30.4N 124.7E	PCN 3	DNSP15	CI 004	RKSD
109	312205	30.4N 124.2E	PCN 3	T2.0/3.0 /W1.0/24HRS	DNSP15	R004
110	312231	30.4N 124.2E	PCN 3	T2.5/3.5 /W0.5/24HRS	DNSP15	PG14
111	312346	30.4N 124.6E	PCN 3	NNAA5		PG14
112	011045	30.4N 124.4E	PCN 3	DNSP15		RPMK
113	011045	30.4N 124.4E	PCN 6	DNSP15		RKSD
114	011045	30.4N 124.4E	PCN 6	DNSP15		R004
115	011112	30.4N 124.4E	PCN 5	DNSP15	CI 004	PG14
116	011550	30.4N 127.7E	PCN 3	DNSP15		RPMK
117	011551	30.4N 127.2E	PCN 6	DNSP15		RKSD
118	012145	31.1N 124.4E	PCN 3	T1.0/2.0 /W1.0/24HRS	DNSP15	R004
119	012145	31.1N 124.4E	PCN 3	T2.5/3.5 /W1.0/24HRS	DNSP15	RPMK
120	012145	31.1N 124.4E	PCN 4	T2.0/2.5 /W0.5/24HRS	DNSP15	PG14
121	012213	31.1N 124.8E	PCN 3	DNSP15		PG14
122	012213	31.1N 124.7E	PCN 3	T2.0/2.0	DNSP15	RKSD
123	020058	31.2N 124.4E	PCN 3	NNAA5		PG14
124	021026	31.1N 120.4E	PCN 6	DNSP15		R004
125	021026	32.4N 110.2E	PCN 6	DNSP15	CI 004	PG14
126	021026	32.4N 111.4E	PCN 6	DNSP15		RKSD
127	021059	32.4N 110.3E	PCN 5	DNSP15		PG14
128	021237	31.3N 111.1E	PCN 5	DNSP15		R004
129	021532	31.3N 110.0E	PCN 5	DNSP15		RPMK
130	021533	32.4N 111.1E	PCN 5	DNSP15		R004
131	022126	35.4N 111.6E	PCN 5	T1.0/2.0 /W1.0/24HRS	DNSP15	PG14
*132	022126	36.4N 111.4E	PCN 5	DNSP15		R004
133	022126	37.4N 111.7E	PCN 5	T1.0/2.0 /W1.5/24HRS	DNSP15	RPMK
134	022155	35.4N 111.5E	PCN 5	NNAA5		PG14
135	030315	36.4N 111.2E	PCN 5	DNSP15		PG14
136	030333	37.4N 111.3E	PCN 5	DNSP15		R004
137	030333	36.4N 111.2E	PCN 5	DNSP15		RKSD
					SECONDARY CENTER 36.7N 133.1E	

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	4IN HGT	DBS MSLP	MAX-SFC-VND VEL/HRG/RVG	MAX-FLT-LVL-VND DTH/VEL/BNG/ANG	ACCRY NAV/MET	EYE SHAPE	EYE DIAM.	EYE ORIENT.	EYE TEMP. (C)	MSV OUT/ IN/ JP/SST NO.
1	260545	20.4N 124.1E	1500FT	904	60 350 130	040 35 350 130	5 1			+25 +26	29	2	
2	242130	20.4N 121.4E	700MH	2984	488 55 020 25	040 45 310 120	5 5			+12 +12	3		
3	250108	20.4N 121.4E	700MH	2963	60 350 120	070 40 350 120	5 5			+14			
4	250345	20.4N 121.5E	700MH	2954	983 55 320 35	040 50 360 65	5 2			+14 +15	3		
5	251335	20.4N 121.3E	700MH	2872		270 62 170 90				+15			
6	251553	21.0N 121.4E	700MH	2866	978	360 55 200 120	20 10			+13 +15	4		
7	260334	21.4N 121.7E	700MH	2836	968 50 320 70	050 50 320 50	3 5			+13 +15	5		
8	261540	22.2N 121.2E	700MH	2768	963	060 57 310 142	5 5			+14 +17	6		
9	261920	22.7N 121.3E	700MH	2761		050 46 300 120				+16			
10	270340	23.4N 121.3E	700MH	2786	963 50 250 50		10 10			+14 +15	7		
11	271553	25.2N 111.1E	700MH	2767	961	500 58 310 100	5 5			+16 +18 +16	8		
12	271945	25.3N 110.4E	700MH	2762		320 56 350 100				+17 +14	9		
13	272121	25.3N 110.4E	700MH	2760	962	260 55 190 24	2 10	CIRCULAR 90		+15 +17 +14	9		
14	280330	26.4N 120.1E	700MH	2774	963 50 170 150	250 50 170 130	5 10			+15 +16	9		
15	280330	27.2N 124.6E	700MH	2771		310 61 200 120				+16			
16	281333	27.4N 127.0E	700MH	2836		150 66 180 94				+14		10	
17	281538	27.4N 126.5E	700MH	2837	971	050 55 320 75	5 5	ELLIPICAL 30 20 120		+12 +13		10	
18	290035	28.2N 126.2E	700MH	2793	966 55 150 120	290 56 150 120				+16 +14	11		
19	290240	28.4N 126.0E	700MH	2767	961 65 300 20	140 68 060 85	3 1	CIRCULAR 20		+16 +16 +16	11		
20	291335	29.3N 125.4E	700MH	2774		190 66 090 90				+16 + 0	12		
21	291534	29.4N 124.7E	700MH	2767	961	160 57 030 90	10 5	CIRCULAR 30		+15 +16 +10	12		
22	310558	30.4N 125.1E	700MH	2829	970	240 50 150 45	5 4			+13 +15 +15	13		
23	310859	30.4N 125.0E	700MH	2837		35 060 30 100 60 060 90				+16 +14	14		
24	010250	30.6N 124.4E	700MH	2897		35 080 120 260 65 140 120				+13 +17	15		
25	010444	30.7N 125.2E	700MH	2897	980	280 64 190 90	10 10			+12 +13 +17	15		
26	020336	31.4N 124.8E	700MH	2926	983 35 180 26	310 28 220 60	0 10			+13 +16 +11	15		

RADAR FIXES

FIX NO.	TIME (Z)	RADAR POSITION	RADAR ACCRy	EYE SHAPE	EYE DIAM.	RADAR POSITION	SITE NO.
1	271430	25.3N 131.1E	LAND	PDR	CIRCULAR		
2	271500	25.2N 131.2E	LAND	PDR	CIRCULAR		
3	271700	25.3N 131.1E	LAND	PDR	CIRCULAR		
4	271900	25.2N 131.0E	LAND	GODD	CIRCULAR	40	
5	280000	26.5N 130.0E	LAND			6///3 53010	
6	280100	26.7N 129.8E	LAND			6///3 53210	
7	280100	26.5N 129.9E	LAND			7///5 //	
8	280200	26.7N 129.5E	LAND			6///3 52710	
9	280200	26.5N 129.5E	LAND	PDR	CIRCULAR	90	
10	280200	26.7N 129.6E	LAND			6//11 52919	
11	280300	26.7N 129.2E	LAND	FAIR	CIRCULAR	90	
12	280300	26.8N 129.3E	LAND			6///3 52813	
13	280300	26.8N 129.2E	LAND			6//12 52922	
14	280400	26.8N 129.2E	LAND	FAIR	CIRCULAR	90	
15	280400	26.9N 129.1E	LAND			6///3 53111	
16	280400	26.9N 129.1E	LAND			6///7 72910	

17	280432	27,1N 128,4E	LAND	P/DH	CIRCULAR	70		PCHL CNTN	26,4N 127,8E	47391
18	280500	27,0N 129,0E	LAND				6//1/3 53112		28,4N 129,5E	47390
19	280500	27,0N 129,4E	LAND				6//1/3 72913		26,2N 127,8E	47399
20	280500	27,0N 129,4E	LAND	P/DH	CIRCULAR	77		PCHL CNTN	26,4N 127,8E	47391
21	280500	27,0N 129,4E	LAND	P/DH	CIRCULAR	69		PCHL CNTN	26,4N 127,8E	47391
22	280500	27,0N 129,4E	LAND	FAIR	CIRCULAR	120	EVE		26,2N 127,8E	47397
23	280700	27,3N 128,6E	LAND				5//1/3 73011		26,2N 127,8E	47393
24	280700	27,3N 128,6E	LAND				6//1/3 53413		28,4N 128,5E	47396
25	280701	27,4N 128,6E	LAND	FAIR	CIRCULAR	45		CNTN	26,4N 127,8E	47391
26	280500	27,4N 129,4E	LAND				6//1/3 52910		28,4N 129,5E	47399
27	280501	27,4N 129,4E	LAND	FAIR	CIRCULAR	34		CNTN	26,4N 127,8E	47391
28	280523	27,4N 129,1E	LAND	FAIR	CIRCULAR	35		CNTN	26,4N 127,8E	47391
29	280400	27,7N 128,2E	LAND	FAIR	CIRCULAR	70	EVE		26,2N 127,8E	47393
30	280200	27,7N 128,1E	LAND				5//1/3 73117		26,2N 127,8E	47393
31	280200	27,7N 128,2E	LAND				6//1/3 53310		28,4N 128,5E	47396
32	280230	27,8N 127,8E	LAND	GNDU	CIRCULAR	75		CNTN	26,4N 127,8E	47391
33	281000	27,8N 127,8E	LAND				5//1/3 73015		28,4N 129,5E	47399
34	281000	27,8N 127,9E	LAND				6//1/3 52811		26,4N 127,8E	47391
35	281001	27,8N 127,7E	LAND	GNDU	CIRCULAR	71	EVE		26,2N 127,8E	47393
36	281030	27,8N 127,7E	LAND	GNDU	CIRCULAR	73	EVE		26,2N 127,8E	47393
37	281100	27,8N 127,4E	LAND	GNDU	CIRCULAR	78	EVE		26,2N 127,8E	47393
38	281100	27,8N 127,4E	LAND				21913 72810		26,2N 127,8E	47393
39	281100	27,7N 127,7E	LAND				6//1/3 52712		28,4N 128,5E	47396
40	281130	27,8N 127,4E	LAND	GNDU	ELLIPTICAL	28	EVE		26,4N 127,8E	47391
41	281200	27,8N 127,3E	LAND	GNDU	ELLIPTICAL	30	EVE		26,2N 127,8E	47393
42	281200	27,7N 127,3E	LAND	GNDU	CIRCULAR	50	EVE		26,2N 127,8E	47393
43	281200	27,7N 127,4E	LAND				5//1/3 72614		26,2N 127,8E	47393
44	281200	27,7N 127,5E	LAND				6//1/3 52711		28,4N 128,5E	47396
45	281230	27,6N 127,3E	LAND	GNDU	ELLIPTICAL		EVE		26,4N 127,8E	47391
46	281300	27,7N 127,2E	LAND	FAIR	ELLIPTICAL		EVE		26,4N 127,8E	47391
47	281300	27,4N 127,3E	LAND				5//1/3 73206		28,4N 128,5E	47396
48	281300	27,5N 127,1E	LAND				6//1/3 52720		26,4N 127,8E	47391
49	281330	27,5N 127,3E	LAND	FAIR	CIRCULAR	40		CNTN	26,4N 127,8E	47393
50	281400	27,5N 126,9E	LAND				6//1/3 52714		26,2N 127,8E	47397
51	281400	27,5N 127,0E	LAND				21942 52910		26,2N 127,8E	47393
52	281400	27,5N 127,0E	LAND	FAIR	CIRCULAR	40	EVE		26,2N 127,8E	47393
53	281430	27,5N 127,0E	LAND	GNDU	CIRCULAR	35	EVE		26,4N 127,8E	47391
54	281500	27,5N 127,0E	LAND	GNDU	CIRCULAR	40	EVE		26,2N 127,8E	47397
55	281500	27,5N 126,8E	LAND				21913 72711		26,2N 127,8E	47393
56	281500	27,5N 126,7E	LAND				6//1/3 52811		28,4N 128,5E	47396
57	281530	27,5N 126,8E	LAND	FAIR	CIRCULAR	40	EVE		26,4N 127,8E	47391
58	281500	27,5N 126,6E	LAND				6//1/3 52508		26,2N 127,8E	47397
59	281500	27,5N 126,6E	LAND	FAIR	CIRCULAR	40	EVE		26,2N 127,8E	47393
60	281500	27,5N 126,8E	LAND	FAIR	CIRCULAR	40	EVE		26,2N 127,8E	47393
61	281535	27,5N 126,8E	LAND	FAIR	CIRCULAR	35	EVE		26,2N 127,8E	47393
62	281700	27,5N 126,4E	LAND	FAIR	CIRCULAR	35	EVE		26,2N 127,8E	47393
63	281700	27,5N 126,4E	LAND				21963 72709		26,2N 127,8E	47393
64	281700	27,5N 126,6E	LAND				6//1/3 50000		28,4N 128,5E	47396
65	281730	27,4N 126,5E	LAND	FAIR	CIRCULAR	75	EVE		26,4N 127,8E	47391
66	281500	27,5N 126,5E	LAND				21913 72905		26,2N 127,8E	47397
67	281330	28,0N 126,3E	LAND	FAIR	CIRCULAR	30	EVE		26,4N 127,8E	47391
68	281300	27,8N 126,4E	LAND				6//1/3 73208		26,2N 127,8E	47397
69	281300	27,8N 126,4E	LAND	FAIR	CIRCULAR	30	EVE		26,2N 127,8E	47393
70	281300	27,8N 126,3E	LAND	FAIR	CIRCULAR	30	EVE		26,2N 127,8E	47393
71	282000	27,8N 126,3E	LAND				5//1/3 73105		26,2N 127,8E	47393
72	282100	27,7N 126,4E	LAND	FAIR	CIRCULAR	40	EVE		26,2N 127,8E	47393
73	282200	28,1N 126,4E	LAND				5//1/3 73400		26,2N 127,8E	47393
74	282200	28,1N 126,3E	LAND	FAIR	CIRCULAR	40	EVE		26,2N 127,8E	47393
75	282300	28,1N 126,1E	LAND	FAIR	CIRCULAR	40	EVE		26,2N 127,8E	47393
76	282300	28,1N 126,3E	LAND				5//1/3 73609		26,2N 127,8E	47393
77	282300	28,1N 126,3E	LAND				6//1/3 53205		26,2N 127,8E	47393
78	290100	28,4N 126,3E	LAND				6//1/3 53408		26,2N 127,8E	47393
79	290100	28,4N 126,0E	LAND				5//1/3 73008		26,2N 127,8E	47393
80	290100	28,4N 126,1E	LAND	FAIR	CIRCULAR	40	EVE		26,2N 127,8E	47393
81	290200	28,4N 126,0E	LAND	GNDU	CIRCULAR	40	EVE		26,3N 125,8E	47399
82	290200	28,4N 126,9E	LAND				5//1/3 73209		26,2N 127,8E	47393
83	290200	28,4N 126,2E	LAND				6//1/3 53208		26,2N 127,8E	47393
84	290300	28,4N 126,5E	LAND				6//1/3 73108		26,2N 127,8E	47393
85	290300	28,5N 126,1E	LAND				6//1/3 53009		28,4N 128,5E	47396
86	290400	28,4N 125,8E	LAND				6//1/3 73400		26,2N 127,8E	47393
87	290400	28,4N 125,8E	LAND				6//1/3 53008		28,4N 129,5E	47399
88	290500	28,4N 125,8E	LAND				6//1/3 73400		26,2N 127,8E	47393
89	290500	28,4N 125,7E	LAND				6//1/3 52708		28,4N 129,5E	47399
90	290700	28,5N 125,7E	LAND				6//1/3 70000		26,2N 127,8E	47393
91	290700	28,4N 125,8E	LAND				6//1/3 50000		28,4N 128,5E	47399
92	290800	28,4N 125,8E	LAND				6//1/3 70000		26,2N 127,8E	47393
93	290800	28,4N 125,9E	LAND				6//1/3 50404		28,4N 128,5E	47399
94	290300	28,4N 125,9E	LAND				6//1/3 70000		26,2N 127,8E	47393
95	290300	28,4N 125,9E	LAND				6//1/3 50305		28,4N 129,5E	47399
96	291000	28,4N 125,0E	LAND				6//1/3 70311		26,2N 127,8E	47393
97	291000	28,4N 125,0E	LAND				6//1/3 50400		26,2N 125,8E	47399
98	291100	28,4N 125,0E	LAND				6//1/3 53408		28,4N 129,5E	47399
99	291200	28,2N 125,9E	LAND				6//1/3 53308		28,4N 129,5E	47399
100	291300	28,3N 125,8E	LAND				6//1/3 53105		28,4N 129,5E	47399

TROPICAL STORM AGNES

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCY	UVTRACK CODE	SAT	COMMENTS	SITE
1	240049	15.4N 114.0E	PCN 5	T1.0/1.0	DMSP37A	INIT JAS	RPMK
2	240349	16.4N 115.6E	PCN 5	DMSP37A			RPMK
3	241139	14.5N 115.8E	PCN 5	DMSP37A	C1 UP		RPMK
4	241149	17.3N 115.4E	PCN 5	DMSP37A			PGTM
5	241149	18.4N 115.5E	PCN 5	DMSP37A			RKS0
6	241225	14.1N 115.7E	PCN 5	NN0A5			PGTM
7	241331	19.4N 115.2E	PCN 4	DMSP37A			RPMK
8	242239	19.4N 116.1E	PCN 5	T2.0/2.0	DMSP37A	INIT JAS	RODN
9	250331	19.2N 115.8E	PCN 5	T3.0/3.0 /02.0/24HRS	DMSP37A		RPMK
10	250105	19.7N 115.4E	PCN 5	T3.0/3.0	NN0A5	INIT JAS	PGTM
11	250332	20.0N 115.8E	PCN 3	DMSP37A	EXP0501 10W LVI		RODN
12	250332	20.1N 115.8E	PCN 3	DMSP37A	EXP0501 10W LVI		RPMK
13	250332	20.2N 115.8E	PCN 3	DMSP37A	INIT JAS		RKS0
14	250332	20.3N 115.5E	PCN 4	DMSP37A			RODN
15	251143	21.0N 115.6E	PCN 5	NN0A5			PGTM
16	251313	20.5N 115.7E	PCN 4	DMSP37A			RODN
17	251513	21.1N 115.4E	PCN 3	DMSP37A			RODN
18	251515	21.0N 115.4E	PCN 4	DMSP37A			RPMK
19	252219	21.0N 115.0E	PCN 5	T4.0/4.0 /01.0/27HRS	DMSP37A	PGTM	
20	252220	20.4N 115.1E	PCN 5	T3.0/3.0 /01.0/24HRS	DMSP37A	RODN	
21	250015	21.0N 115.1E	PCN 5	T3.0/3.0 /01.0/24HRS	DMSP37A	RPMK	
22	260015	21.2N 115.6E	PCN 3	T3.0/3.0 /01.0/24HRS	DMSP37A	RODN	
23	260311	21.4N 115.0E	PCN 3	DMSP37A			RPMK
24	260311	21.5N 114.6E	PCN 3	DMSP37A			RKS0
25	261101	21.1N 114.1E	PCN 2	DMSP37A			PGTM
26	261101	21.3N 114.0E	PCN 2	DMSP37A			PGTM
27	261259	20.3N 114.0E	PCN 4	NN0A5			RPMK
28	261259	21.1N 114.0E	PCN 3	DMSP37A			RPMK
29	261555	21.1N 113.3E	PCN 5	DMSP37A			RPMK
30	261555	21.1N 113.9E	PCN 3	DMSP37A			RODN
31	262205	21.2N 113.5E	PCN 1	T4.0/4.0	DMSP37A	INIT JAS	RKS0
32	262200	21.3N 113.3E	PCN 1	T4.5/4.5 /00.5/24HRS	DMSP37A	PGTM	
33	262357	21.4N 112.9E	PCN 1	T4.0/4.0 /00.5/24HRS	DMSP37A	RPMK	
34	262357	21.4N 113.0E	PCN 1	T3.5 /00.5/25HRS	DMSP37A	RODN	
35	271041	21.2N 112.6E	PCN 1	DMSP37A			RPMK
36	271041	21.0N 112.4E	PCN 2	DMSP37A			PGTM
37	271139	21.1N 112.3E	PCN 1	DMSP37A			RKS0
38	271533	20.4N 112.1E	PCN 4	T4.0/4.0/0/50.0/24HRS	DMSP37A	RPMK	
39	271533	21.1N 111.9E	PCN 1	DMSP37A	BANDING EYE		PGTM
40	272322	20.4N 111.6E	PCN 2	DMSP37A			RODN
41	272339	20.9N 112.0E	PCN 1	T3.0/3.5 /#0.5/24HRS	DMSP37A	RODN	
42	272340	20.9N 111.7E	PCN 1	T3.0/4.0 /#1.0/24HRS	DMSP37A	RKS0	
43	272340	20.9N 111.8E	PCN 1	T4.0/4.0/0/50.0/24HRS	DMSP37A	RPMK	
44	280231	21.0N 111.8E	PCN 5	DMSP37A	C1 SAME		RODN
45	280420	20.4N 112.0E	PCN 1	DMSP37A			RPMK
46	281203	20.4N 111.8E	PCN 4	DMSP37A			RODN
47	291203	20.3N 112.2E	PCN 5	DMSP37A			RPMK
48	281222	20.4N 111.6E	PCN 4	DMSP37A	C1 D044		RODN
49	281222	20.5N 111.8E	PCN 4	DMSP37A	C1 D044		RKS0
50	281320	20.5N 112.3E	PCN 5	DMSP37A			RPMK
51	281320	20.3N 112.2E	PCN 5	DMSP37A			PGTM
52	282323	20.5N 112.5E	PCN 5	DMSP37A			PGTM
53	282323	20.6N 112.7E	PCN 3	T2.5/3.5 /#1.5/24HRS	DMSP37A	RPMK	
54	290402	20.3N 112.7E	PCN 1	T3.0/3.0 /#50.0/24HRS	DMSP37A	RODN	
55	290402	20.4N 113.4E	PCN 1	DMSP37A			RPMK
56	291144	21.3N 114.7E	PCN 2	DMSP37A			RODN
57	291144	21.5N 114.4E	PCN 6	DMSP37A			RPMK
58	291204	21.3N 114.4E	PCN 4	DMSP37A			PGTM
59	291204	21.5N 114.3E	PCN 6	DMSP37A			RKS0
60	291544	21.5N 114.7E	PCN 6	DMSP37A	APPEARS WEAKER		RODN
61	291544	22.0N 114.6E	PCN 4	DMSP37A	C1 D044		RPMK
62	292243	22.6N 115.0E	PCN 3	T3.0/3.0	DMSP37A	INIT JAS	RKS0
63	292243	22.7N 114.5E	PCN 3	T2.5/2.5 /#50.0/23HRS	DMSP37A	RPMK	
64	300114	22.5N 114.9E	PCN 5	T2.5/2.5	NN0A5	INIT JAS	PGTM
65	303344	22.3N 115.2E	PCN 3	DMSP37A	CENTRAL CLOUD MASS 23.2N 114.4E		RPMK
66	300345	22.7N 115.3E	PCN 3	DMSP37A			RKS0
67	303445	23.0N 114.4E	PCN 5	T2.0/2.0	DMSP37A	INIT JAS	RODN
68	301124	23.0N 114.6E	PCN 6	DMSP37A			RODN
69	310030	24.3N 119.1E	PCN 3	T1.0/2.0 /#1.5/23HRS	NN0A5		PGTM

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCY	EYE	EYF	RADING-CODE	DIAM	ASWAM TDDFF	COMMENTS	RADAR POSITION	SITE	WWO NO.
1	250010	19.7N 115.8E	LAND		55611 50107						22.3N 114.2E		45005
2	240400	20.1N 114.7E	LAND		55711 54111						22.3N 114.2E		45005
3	240700	20.3N 115.7E	LAND		55611 /////						22.3N 114.2E		45005
4	250900	20.9N 115.7E	LAND		55671 /////						22.3N 114.2E		45005
5	251200	21.2N 115.7E	LAND		55661 /////						22.3N 114.2E		45005
6	251500	21.3N 115.5E	LAND		55641 11111						22.3N 114.2E		45005
7	251758	21.4N 115.5E	LAND		213M 73403						22.3N 114.2E		45005
8	242100	21.4N 115.2E	LAND		35/6 /////						22.3N 114.2E		45005
9	260000	21.5N 114.8E	LAND		35/6 72806						22.3N 114.2E		45005

10	260300	21.5N 114.5E	LAND	2107/ 72900	22.3N 114.2E	45005
11	260500	21.5N 114.4E	LAND	2107/ 52700	22.3N 114.2E	45005
12	260700	21.5N 114.1E	LAND	2107/ 52200	22.3N 114.2E	45005
13	261200	21.3N 114.0E	LAND	10811 52700	22.3N 114.2E	45005
14	261400	21.3N 113.9E	LAND	10811 52700	22.3N 114.2E	45005
15	261500	21.3N 113.8E	LAND	10811 52700	22.3N 114.2E	45005
16	261500	21.3N 113.8E	LAND	10811 52703	22.3N 114.2E	45005
17	261700	21.3N 113.8E	LAND	10811 52703	22.3N 114.2E	45005
18	261400	21.3N 113.7E	LAND	10811 52800	22.3N 114.2E	45005
19	261300	21.3N 113.6E	LAND	10811 52805	22.3N 114.2E	45005
20	262130	21.3N 113.5E	LAND	10912 52700	22.3N 114.2E	45005
21	270000	21.3N 113.3E	LAND	10912 52700	22.3N 114.2E	45005
22	270300	21.3N 113.0E	LAND	10942 52700	22.3N 114.2E	45005
23	270500	21.3N 112.7E	LAND	10942 52700	22.3N 114.2E	45005
24	270400	21.3N 112.5E	LAND	10913 92703	22.3N 114.2E	45005
25	271200	21.2N 112.3E	LAND	21043 52400	22.3N 114.2E	45005
26	271300	21.1N 112.2E	LAND	10843 52300	22.3N 114.2E	45005
27	271400	21.1N 112.1E	LAND	10143 52700	22.3N 114.2E	45005
28	271500	21.1N 112.0E	LAND	10813 52900	22.3N 114.2E	45005
29	271500	21.0N 111.9E	LAND	20843 52400	22.3N 114.2E	45005
30	271300	20.9N 111.8E	LAND	211// 52200	22.3N 114.2E	45005
31	272100	20.9N 112.0E	LAND	211// // / / / /	22.3N 114.2E	45005
32	272200	20.9N 112.0E	LAND	20873 53000	22.3N 114.2E	45005
33	272300	20.9N 112.0E	LAND	20843 50000	22.3N 114.2E	45005
34	280000	20.9N 111.9E	LAND	20843 5// / /	22.3N 114.2E	45005
35	280200	20.9N 111.9E	LAND	20843 72103	22.3N 114.2E	45005
36	280500	20.9N 111.8E	LAND	20813 73000	22.3N 114.2E	45005
37	281200	20.9N 112.0E	LAND	20843 61205	22.3N 114.2E	45005
38	281500	20.9N 112.2E	LAND	20843 71300	22.3N 114.2E	45005
39	281800	20.9N 112.4E	LAND	20843 70400	22.3N 114.2E	45005
40	282100	20.9N 112.6E	LAND	10843 50700	22.3N 114.2E	45005
41	282200	20.9N 112.7E	LAND	20843 51107	22.3N 114.2E	45005
42	290000	20.8N 112.9E	LAND	20843 50814	22.3N 114.2E	45005
43	290200	20.8N 113.1E	LAND	10723 50907	22.3N 114.2E	45005
44	290300	20.8N 113.3E	LAND	10813 50415	22.3N 114.2E	45005
45	290400	20.7N 113.4E	LAND	10713 50703	22.3N 114.2E	45005
46	290500	20.8N 113.7E	LAND	10530 50700	22.3N 114.2E	45005
47	290700	21.2N 114.2E	LAND	10722 60710	22.3N 114.2E	45005
48	291200	21.5N 114.4E	LAND	20843 50611	22.3N 114.2E	45005
49	292100	22.5N 114.4E	LAND	20873 // / / / /	22.3N 114.2E	45005
50	300000	22.9N 114.7E	LAND	20873 // / / / /	22.3N 114.2E	45005

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TROPICAL STORM BONNIE

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	UVDRAK CONE	SAT	COMMENTS	SITE
1	090140	19.3N 114.5E	PCN 5	T0.0/0/0.0	N0AAS	INIT DHS	PGTM
2	091219	20.0N 114.5E	PCN 6		N0AAS		PGTM
3	092318	19.5N 114.3E	PCN 3	T1.0/1/0.0	DNSP36	INIT DHS	RPMK
4	100056	19.0N 113.9E	PCN 3	T1.0/1/0.0 /D1.0/24HRS	N0AAS		PGTM
5	100352	14.3N 113.8E	PCN 5		DNSP15		RPMK
6	101113	14.3N 112.2E	PCN 6		DNSP17		RDN4
7	101113	16.9N 110.7E	PCN 5				RPMK
8	101200	14.4N 112.5E	PCN 5		DNSP16	C1 SAME	PGTM
9	101534	18.1N 111.0E	PCN 6		DNSP15		RPMK
10	102213	17.4N 110.5E	PCN 5		DNSP17		PGTM
11	1n2213	17.5N 110.7E	PCN 5		DNSP17		RPMK
12	110042	17.5N 110.4E	PCN 3	T2.5/2.5 / 01.5/25HRS	DNSP16		RPMK
13	110334	17.9N 109.4E	PCN 5		DNSP15	MID AND LOW LVL	RPMK
14	111054	17.9N 107.9E	PCN 6		DNSP17		PGTM
15	111324	16.2N 106.2E	PCN 6		DNSP16	UPR LVL	RPMK
16	111515	16.4N 106.5E	PCN 6		DNSP15	UPR LVL	RPMK
17	120021	17.4N 105.0E	PCN 3	T2.5/2.5/-50.0/24HRS	DNSP16		PGTM
18	120125	17.5N 104.7E	PCN 6		N0AAS		PGTM
19	120316	17.7N 104.0E	PCN 5		DNSP15		RPMK

TYPHOON CARMEN

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SATELLITE FIXES

FIX NO.	TIME (Z)	FTX POSITION	ACCRY	UVTRAK CODE	SAT	COMMENTS	SITE
1	080104	16.3N 145.4E	PCV 5	T4+0/0+0	DMSR24	INIT J15	PGTM
2	091023	16.3N 145.7E	PCV 5		N00A44		PGTd
3	092300	16.3N 145.5E	PCV 5	T1+0/1+0	N00A44	INIT J15	PGTd
4	100211	17.1N 143.4E	PCV 5		DMSR24		PGTd
5	100322	15.0N 145.6E	PCV 5		DMSR24	CL UP	PGTd
6	101019	15.2N 145.7E	PCV 5		DMSR24		PGTd
7	101311	15.5N 145.6E	PCV 5		DMSR24		PGTd
8	102032	15.2N 144.6E	PCV 5	T2+0/2+0 /W1+0/22HRS	DMSR24		PGTd
9	102111	15.2N 144.5E	PCV 5		DMSR24		PGTd
10	110012	16.1N 144.8E	PCV 5		N00A44		PGTd
11	110312	14.0N 144.0E	PCV 5		DMSR24		PGTd
12	110413	15.7N 144.2E	PCV 5		DMSR24	CL SAME	PGTd
13	111636	15.7N 144.3E	PCV 5		DMSR24		PGTd
14	112012	15.7N 144.4E	PCV 3	T2+5/2+5 /W0+5/24HRS	DMSR24		PGTd
15	112243	15.9N 144.4E	PCV 3	T4+0/4+0	DMSR24	INIT J15	RPMK
16	112243	15.9N 144.4E	PCV 3		DMSR24		PGTd
17	120135	16.1N 144.7E	PCV 3		DMSR24		PGTd
18	120453	17.0N 144.2E	PCV 5		DMSR24	CL SAME	PGTd
19	120553	19.3N 145.4E	PCV 5		DMSR24	UPR LVL	RODN
20	121122	19.0N 143.4E	PCV 5		DMSR24		PGTd
21	121417	19.1N 143.3E	PCV 5		DMSR24		PGTd
22	122136	19.5N 141.6E	PCV 5	T3+5/3+5 /W1+0/25HRS	DMSR24		PGTd
23	122136	19.5N 141.6E	PCV 4		DMSR24		RODN
24	122225	19.6N 141.6E	PCV 5		DMSR24		PGTd
25	122225	19.6N 141.3E	PCV 3	T3+0/3+0	DMSR24	INIT J15	RODN
26	130116	20.3N 140.4E	PCV 5		DMSR24		PGTd
27	131015	21.3N 139.2E	PCV 2		DMSR24		RODN
28	131015	21.4N 139.5E	PCV 1		DMSR24	INIT J15	RKSO
29	131015	21.5N 139.7E	PCV 2		DMSR24	CL UP	PGTd
30	131103	21.5N 139.5E	PCV 2		DMSR24		PGTd
31	131359	21.7N 137.2E	PCV 2		DMSR24		PGTd
32	132116	22.0N 135.4E	PCV 3	T3+5/3+5 /W0+0/24HRS	DMSR24		PGTd
33	132116	23.0N 135.5E	PCV 3	T4+5/4+5	DMSR24	INIT J15	RKSO
34	132208	23.1N 135.4E	PCV 1		DMSR24		PGTd
35	132355	23.2N 134.9E	PCV 3		N00A44		PGTd
36	140290	23.3N 134.0E	PCV 1		DMSR24		PGTd
37	141261	24.0N 134.3E	PCV 1	T4+0/4+0	DMSR24	INIT J15	RPMK
38	141261	23.9N 134.4E	PCV 1	T4+5/4+5	DMSR24		RODN
39	141261	24.0N 134.5E	PCV 1	T4+5/4+5	24HRS	DMSR24	RKSO
40	140355	25.3N 130.5E	PCV 2		DMSR24		RPMK
41	141036	26.7N 132.2E	PCV 1		N00A44		PGTd
42	141523	25.0N 130.0E	PCV 2		DMSR24		PGTd
43	142055	26.2N 129.6E	PCV 2	T4+5/4+5 /W0+0/24HRS	DMSR24		PGTd
44	142237	26.1N 129.4E	PCV 3		DMSR24		RPMK
45	142323	26.4N 129.7E	PCV 1	T5+0/5+0 /W0+5/24HRS	DMSR24		RKSO
46	142323	26.4N 129.9E	PCV 2		DMSR24		PGTd
47	142333	26.3N 129.8E	PCV 1	T2+0/5+0 /W0+5/21HRS	DMSR24		RODN
48	150108	26.4N 129.5E	PCV 1		N00A44		PGTd
49	150222	26.7N 129.1E	PCV 1		DMSR24		PGTd
50	150223	26.7N 127.9E	PCV 1	T4+5/4+5 /W0+5/24HRS	DMSR24		RPMK
51	150223	26.7N 127.9E	PCV 1		DMSR24		RKSO
52	151223	27.2N 128.0E	PCV 1		DMSR24		RODN
53	151117	27.2N 128.4E	PCV 2		DMSR24		RPMK
54	151118	27.4N 126.6E	PCV 2		DMSR24		RKSO
55	151149	27.5N 125.9E	PCV 1		N00A44		PGTd
56	151215	27.6N 125.8E	PCV 2		DMSR24		PGTd
57	151303	27.9N 125.1E	PCV 1		DMSR24		PGTd
58	152217	27.9N 124.0E	PCV 3	T5+0/5+0 /W0+0/23HRS	DMSR24		RODN
59	152217	28.0N 124.1E	PCV 1	T4+0/5+0 /W1+0/24HRS	DMSR24		RKSO
60	152318	28.1N 124.1E	PCV 1	T5+0/5+0 /W0+5/23HRS	DMSR24		RPMK
61	152318	28.3N 123.1E	PCV 1	T5+0/5+0 /W0+5/25HRS	DMSR24		PGTd
62	160205	29.1N 121.6E	PCV 1		DMSR24		RKSO
63	160205	29.3N 123.5E	PCV 1		DMSR24		PGTd
64	160205	29.4N 123.6E	PCV 5		DMSR24		RODN
65	161056	27.3N 123.0E	PCV 2		DMSR24		RPMK
66	161056	28.4N 123.2E	PCV 1		DMSR24		RKSO
67	161157	28.4N 123.3E	PCV 3		DMSR24		PGTd
68	161445	28.4N 123.0E	PCV 3		DMSR24		PGTd
69	161528	28.2N 122.4E	PCV 3		DMSR24		RPMK
70	161528	28.7N 122.4E	PCV 6		DMSR24		RODN
71	162158	28.7N 122.7E	PCV 5	T3+5/4+0 /W0+5/24HRS	DMSR24		RKSO
72	162158	28.5N 122.2E	PCV 5	T3+5/4+5 /W1+5/23HRS	DMSR24		PGTd
73	162158	28.4N 122.4E	PCV 5	T3+5/4+5 /W1+5/22HRS	DMSR24		RPMK
74	162258	28.4N 122.4E	PCV 5		DMSR24		PGTd
75	171147	29.1N 122.7E	PCV 5		DMSR24		PGTd
76	171329	29.4N 122.4E	PCV 5		DMSR24		RKSO
77	171329	29.5N 122.0E	PCV 6	T3+5/4+5 /W1+5/29HRS	DMSR24		RODN
78	171038	29.5N 123.0E	PCV 6		DMSR24		PGTd
79	171038	29.3N 122.6E	PCV 6		DMSR24		RODN
80	171139	29.7N 123.1E	PCV 5		DMSR24		PGTd
81	171511	29.2N 123.1E	PCV 5		DMSR24		RKSO
82	171511	29.4N 123.1E	PCV 3		DMSR24		RPMK
83	172138	29.7N 123.1E	PCV 6	T2+0/3+0 /W1+5/14HRS	DMSR24		RODN
84	172138	29.6N 123.4E	PCV 5	T2+0/3+0 /W1+5/24HRS	DMSR24		PGTd
85	172241	29.4N 123.5E	PCV 5		DMSR24		RODN
86	172241	29.1N 123.4E	PCV 5		DMSR24		RKSO
87	180051	29.4N 123.3E	PCV 3		N00A44		PGTd
88	180311	29.4N 123.6E	PCV 3	T3+0/3+5 /W0+5/29HRS	DMSR24		RPMK
89	180311	29.5N 123.6E	PCV 5		DMSR24		RODN
90	180311	29.6N 123.4E	PCV 5		DMSR24		RKSO
91	180311	29.5N 123.6E	PCV 5	T2+0/3+0 /W1+5/24HRS	DMSR24		RKSO
92	181012	29.3N 124.0E	PCV 5		DMSR24		RKSO
93	181012	27.4N 124.1E	PCV 4		DMSR24		PGTd

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V4	181122	27.4N	124.0E	PVC 4		DMSH16	PGLA
V5	181133	27.4N	124.1E	PVC 5		N00A00	PGLA
V6	181304	24.4N	124.1E	PVC 6		DMSH16	PGLA
V7	181355	24.3N	124.0E	PVC 7		DMSH16	RK50
V8	181555	24.5N	124.0E	PVC 8		DMSH16	RP4C
V9	182119	24.3N	124.1E	PVC 9		DMSH16	ROCK
100	182119	24.0N	124.0E	PVC 10		DMSH16	PGLA
101	182223	24.2N	124.2E	PVC 11		DMSH16	PGLA
102	180004	24.4N	124.0E	PVC 12	T0.0/1.0/-/+1.0/21HRS	DMSH16	RP4C
103	180004	24.3N	124.0E	PVC 13	T0.0/2.0/-/+0.0/21HRS	N00A00	PGLA
104	191000	30.5N	125.2E	PVC 14		DMSH17	RK50
105	191000	30.5N	125.2E	PVC 15		DMSH17	PGLA
106	191044	30.7N	125.5E	PVC 16		N00A00	PGLA
107	191247	31.1N	125.7E	PVC 17		DMSH16	ROCK
108	191535	32.5N	126.5E	PVC 18		DMSH16	RP4C
109	191535	31.5N	125.7E	PVC 19		DMSH16	RODN
110	192054	31.2N	126.3E	PVC 20		DMSH17	RODN
111	192054	34.0N	126.0E	PVC 21		DMSH17	PGLA
112	192054	33.9N	126.1E	PVC 22		DMSH17	RK50
113	192205	34.2N	126.2E	PVC 23		DMSH16	PGLA
114	200122	35.0N	126.2E	PVC 24	T1.0/2.0/-/+1.0/25HRS	N00A00	PGLA
115	200235	35.9N	127.4E	PVC 25		DMSH17	PGLA
116	200235	35.4N	127.7E	PVC 26	T0.0/1.0/-/+2.0/22HRS	DMSH17	RK50

ATTACHMENT FIXES

Fix No.	Time (Z)	Fix Position	Flt Lvl	Kin Hgt	SWS MSLP	Max-SFC-Wnd Vel/deg/hng	Max-Flt-Lvl-Wnd Vel/mph/deg	Acc/Hdg Nav/Met	Eye Shape	Eye Orient-Diam/Tilt	Eye Temp (C) Units	HR No.
* 1	101128	17.3N 144.0E	1500FT	1004	15 010 10						+26 29	1
* 2	101053	17.0N 143.0E	1500FT	1007	25 170 130	200 15 170 75	15 5			+26 +26 +25 29	1	
3	101020	16.7N 145.7E	700MH			110 20 270 260	5 5			+12 +11	2	
4	110303	16.1N 144.3ME	700MH	1005	60 010 30	120 40 010 30				+10 +9	3	
5	110309	15.5N 144.5ME	700MH	1014	992	70 220 15	000 40 350 60	4 5		+12 +12 +11	3	
6	111100	15.5N 144.5ME	700MH	1005		200 45 070 17				+14 +4	4	
7	111433	15.8N 144.3ME	700MH	2989	289	120 55 190 22	4 2	ELLIPTICAL 35 22 120		+10 +14 +07	4	
8	112228	15.9N 144.3ME	700MH	2952	983	30 170 15	230 80 170 4	1 5	CIRCULAR 25	+13 +15 +11	5	
9	120100	16.2N 144.3ME	700MH	2942	100	310 10	000 65 310 15			+10	5	
10	120135	16.3N 144.1ME	700MH	2924	380	30 240 10	200 65 240 10	2 5	CIRCULAR 20	+12 +19	5	
11	121235	17.5N 143.1E	700MH	2972		150 61 050 40				+17 +9	6	
12	121531	18.3N 142.9ME	700MH	2949	283	150 61 110 40	10 10			+13 +16 +1T	5	
13	130338	20.5N 140.2ME	700MH	2994	976	40 090 15	150 90 090 15	5 5	CIRCULAR 25	+10 +19 +11	7	
14	131510	22.3N 137.1E	700MH	2864	974	150 70 120 45	5 5	ELLIPTICAL 35 20 50		+09 +16 +1n	8	
15	131735	22.5N 136.3E	700MH	2851		230 52 350 25				+15 +11	8	
16	140120	23.5N 134.4E	700MH	2813	969	40 140 15	200 65 140 15	3 1	CIRCULAR 28	+15 +19 +12	9	
17	140613	23.4N 133.1E	700MH	2814	969	50 180 20	200 70 180 20	3 1	CIRCULAR 25	+12 +18 +12	9	
18	141549	25.7N 130.8ME	700MH	2783	965	100 55 190 35	5 3	ELLIPTICAL 25 20 30		+11 +16 +13	10	
19	141915	25.3N 129.9ME	700MH	2752		110 110 300 15				+14 +16	10	
20	142037	26.1N 129.5ME	700MH	2765	963	010 65 320 25	5 3	CIRCULAR 28	+12 +16 +11	10		
21	151231	27.5N 125.8ME	700MH	2752		000 89 360 25				+18 +13	11	
22	151634	27.9N 125.1E	700MH	2744		000 85 350 15	5 2	CIRCULAR 15	+16 +18 +10	11		

WAJAH PAGES

FIX NO.	TIME (Z)	FIX POSITION	HADAR	ACCHY	EYE SHAPE	EYE DIAH	RADIUM-CODE ANSAH TUFF	COMMENTS	HADAR POSITION	SITE NO.
1	110645	15-8N 144-7E	LAND		ELLIPTICAL	12		OPEN NW	13-0N 144-9E	91218
2	110745	16-0N 144-9E	LAND		ELLIPTICAL	14		OPEN W THRU S	13-0N 144-9E	91218
3	110845	15-9N 144-9E	LAND	GOOD	CIRCULAR	25		OPEN NW AND SE	13-0N 144-9E	91218
4	110945	15-9N 144-2E	LAND		ELLIPTICAL	21		OPEN NW AND E THRU S	13-0N 144-2E	91218
5	111045	15-7N 144-3E	LAND	GOOD	CIRCULAR	25		OPEN E	13-0N 144-9E	91218
6	111145	15-7N 144-9E	LAND	GOOD	CIRCULAR	23		OPEN NW AND E	13-0N 144-9E	91218
7	111245	15-7N 144-5E	LAND	POOR				OPEN W THRU E	13-0N 144-9E	91218
8	111345	15-9N 144-5E	LAND	GOOD	CIRCULAR	25		OPEN NF THRU S	13-0N 144-9E	91218
9	111445	15-9N 144-9E	LAND	GOOD	CIRCULAR	40		OPEN NF	13-0N 144-9E	91218
10	111545	15-9N 144-7E	LAND	GOOD	CIRCULAR	45		OPEN NW	13-0N 144-9E	91218
11	111645	15-9N 144-6E	LAND	GOOD	CIRCULAR	20		OPEN NW	13-0N 144-9E	91218
12	111745	15-9N 144-5E	LAND	GOOD	CIRCULAR	40		OPEN NW	13-0N 144-9E	91218
13	111845	16-0N 144-1E	LAND	POOR	ELLIPTICAL	40		OPEN W THRU N THRU E	13-0N 144-9E	91218
14	111945	15-9N 144-3E	LAND	GOOD	CIRCULAR	32		OPEN NW AND SE	13-0N 144-9E	91218
15	120245	16-0N 144-3E	LAND	GOOD	CIRCULAR	30		OPEN N	13-0N 144-9E	91218
16	141400	25-1N 131-0E	LAND				6/1111 7/1111		26-1N 127-0E	67937
17	141500	25-2N 131-2E	LAND				6/1111 53019		26-1N 127-0E	67937
18	141500	25-2N 131-2E	LAND				6/1112 52812		26-1N 127-0E	67937
19	141600	25-5N 131-0E	LAND	GOOD		20		MWV 3125	26-1N 127-0E	67937
20	141600	25-5N 130-9E	LAND				6/1112 53122		26-1N 127-0E	67937
21	141600	25-4N 130-8E	LAND				21001 63019		26-1N 127-0E	67937
22	141700	25-6N 130-7E	LAND	GOOD		20		MWV 2930	26-1N 127-0E	67937
23	141700	25-7N 130-6E	LAND				20702 53123		26-1N 127-0E	67937
24	141700	25-6N 130-6E	LAND				11/111 73019		26-1N 127-0E	67937
25	141800	25-7N 130-5E	LAND	GOOD		20		MWV 3130	26-1N 127-0E	67937
26	141800	25-8N 130-4E	LAND				10712 53019		26-1N 127-0E	67937
27	141800	25-8N 130-2E	LAND				10811 73020		26-1N 127-0E	67937
28	141900	26-0N 130-1E	LAND	GOOD		20		MWV 3130	26-1N 127-0E	67937
29	141900	26-0N 130-0E	LAND				10842 53019		26-1N 127-0E	67937
30	141900	25-9N 130-0E	LAND				10811 73018		26-1N 127-0E	67937
31	141930	25-6N 129-9E	LAND						26-1N 127-0E	67937
32	142000	26-1N 129-9E	LAND	GOOD		20		MWV 3130	26-1N 127-0E	67937
33	142000	26-0N 129-9E	LAND				10811 73016		26-1N 127-0E	67937
34	142000	26-1N 129-8E	LAND				10812 53013		26-1N 127-0E	67937
35	142005	25-7N 129-5E	LAND	POOR					26-1N 127-0E	67937
36	142030	26-0N 129-0E	LAND	GOOD					26-1N 127-0E	67937
37	142100	26-2N 129-0E	LAND	GOOD		20		MWV 3130	26-1N 127-0E	67937
38	142100	26-2N 129-5E	LAND				10812 52919		26-1N 127-0E	67937
39	142100	26-1N 129-4E	LAND				10711 72824		26-1N 127-0E	67937

40	142103	26.1N	129.4E	LAND	GOOD			26.3N 127.8E	67931	
41	142130	26.1N	129.4E	LAND	GOOD			26.3N 127.8E	67931	
42	142200	26.1N	129.4E	LAND	GOOD	CIRCULAR	25	26.3N 127.8E	67931	
43	142200	26.2N	129.2E	LAND			10811 72912	26.1N 127.8E	67931	
44	142200	26.3N	129.3E	LAND			10812 53112	26.4N 129.3E	67931	
45	142200	26.3N	129.3E	LAND	GOOD	CIRCULAR	18	26.1N 127.7E	67931	
46	142230	26.2N	129.1E	LAND	GOOD	CIRCULAR	25	26.1N 127.8E	67931	
47	142300	26.1N	129.1E	LAND	GOOD		10811 72917	26.1N 127.8E	67931	
48	142300	26.1N	129.1E	LAND	GOOD	ELLIPTICAL	20	26.3N 127.8E	67931	
49	142300	26.1N	129.1E	LAND	GOOD	ELLIPTICAL	20	26.1N 127.7E	67931	
50	142300	26.1N	129.1E	LAND	POOR			26.4N 129.3E	67931	
51	142300	26.1N	129.1E	LAND			10812 52920	26.1N 127.7E	67931	
52	142330	26.1N	129.1E	LAND	GOOD	ELLIPTICAL	17	26.3N 127.8E	67931	
53	150000	26.1N	129.1E	LAND	GOOD	ELLIPTICAL	20	26.3N 127.8E	67931	
54	150000	26.1N	129.1E	LAND	GOOD	ELLIPTICAL	17	26.3N 127.8E	67931	
55	150000	26.1N	129.1E	LAND			10812 52913	26.4N 129.3E	67931	
56	150000	26.1N	129.1E	LAND	GOOD		20	26.2N 127.8E	67930	
57	150030	26.1N	129.1E	LAND	GOOD	ELLIPTICAL	22	26.3N 127.8E	67931	
58	150100	26.1N	129.1E	LAND			14711 72910	26.1N 129.3E	67931	
59	150100	26.1N	129.1E	LAND	GOOD	ELLIPTICAL	18	26.3N 127.8E	67930	
60	150100	26.1N	129.1E	LAND	GOOD	ELLIPTICAL	19	26.3N 127.8E	67931	
61	150100	26.1N	129.1E	LAND	GOOD		20	26.1N 127.7E	67931	
62	150100	26.1N	129.1E	LAND				26.4N 129.3E	67930	
63	151130	26.4N	129.3E	LAND	GOOD	ELLIPTICAL	16	26.1N 127.8E	67931	
64	150200	26.7N	129.2E	LAND	GOOD		18	26.2N 127.6E	67930	
65	150200	26.8N	129.2E	LAND	GOOD	ELLIPTICAL	17	26.3N 127.8E	67931	
66	150200	26.8N	129.2E	LAND	GOOD		20	26.1N 127.7E	67931	
67	150200	26.8N	129.2E	LAND				26.4N 129.3E	67930	
68	150200	26.8N	129.2E	LAND			5//42 52914	26.1N 127.8E	67931	
69	150300	26.8N	129.2E	LAND	GOOD	ELLIPTICAL	20	11711 72915	26.1N 127.8E	67931
70	150300	26.8N	129.2E	LAND	GOOD	ELLIPTICAL	20	11711 73010	26.1N 127.8E	67931
71	150300	26.7N	129.0E	LAND			4//12 53113	26.4N 129.3E	67930	
72	150300	26.3N	129.0E	LAND	GOOD		15	26.3N 127.8E	67931	
73	150300	26.8N	127.9E	LAND	POOR		20	26.1N 127.6E	67930	
74	150330	26.8N	127.8E	LAND	GOOD	ELLIPTICAL	20	26.1N 127.6E	67931	
75	150400	27.0N	127.0E	LAND	POOR			26.2N 127.6E	67930	
76	150400	26.8N	127.0E	LAND			11811 72910	26.1N 127.8E	67931	
77	150400	26.9N	127.0E	LAND			5//42 53212	26.4N 129.3E	67930	
78	150400	26.9N	127.7E	LAND	GOOD	ELLIPTICAL	21	26.1N 127.8E	67931	
79	150400	26.9N	127.7E	LAND	GOOD		15	26.1N 127.7E	67931	
80	150500	27.0N	127.6E	LAND			5//42 53013	26.4N 129.3E	67930	
81	150500	27.1N	127.5E	LAND	GOOD		18	26.1N 127.7E	67931	
82	150500	27.0N	127.5E	LAND	GOOD	CIRCULAR	23	26.1N 127.8E	67931	
83	150500	27.0N	127.4E	LAND			10711 72915	26.1N 127.8E	67931	
84	150800	27.1N	127.2E	LAND			10811 73014	26.1N 127.8E	67931	
85	150800	27.1N	127.2E	LAND			6//41 53013	26.4N 129.3E	67930	
86	150600	27.1N	127.3E	LAND	GOOD		18	26.1N 127.7E	67931	
87	150700	27.1N	127.3E	LAND			3//13 53011	26.4N 129.3E	67931	
88	150700	27.2N	127.3E	LAND	GOOD		10812 73012	26.1N 127.6E	67930	
89	150700	27.3N	127.3E	LAND	GOOD		28	26.1N 127.7E	67931	
90	150700	27.2N	127.2E	LAND			1//41 53015	26.4N 129.3E	67930	
91	150800	27.3N	127.3E	LAND	GOOD	CIRCULAR	16	26.1N 127.8E	67931	
92	150800	27.3N	126.8E	LAND			10712 72912	26.1N 127.8E	67931	
93	150800	27.2N	126.9E	LAND			6//41 52716	26.4N 129.3E	67930	
94	150800	27.3N	126.9E	LAND			3//12 53110	26.4N 129.3E	67931	
95	150800	27.3N	126.8E	LAND	GOOD		23	26.1N 127.7E	67931	
96	150900	27.3N	126.5E	LAND			10711 72912	26.1N 127.8E	67931	
97	150900	27.4N	126.6E	LAND			3//12 53011	26.4N 129.3E	67930	
98	150900	27.3N	126.5E	LAND	GOOD		25	26.1N 127.7E	67931	
99	150900	27.2N	126.5E	LAND	GOOD		6//41 52820	26.4N 129.3E	67930	
100	151000	27.5N	126.4E	LAND			3//12 52910	26.4N 129.3E	67931	
101	151000	27.3N	126.3E	LAND	GOOD		18	26.1N 127.8E	67930	
102	151000	27.4N	126.4E	LAND	FAIR	CIRCULAR	17	26.1N 127.8E	67931	
103	151000	27.4N	126.3E	LAND			20842 72914	26.1N 127.8E	67931	
104	151030	27.5N	126.2E	LAND	FAIR	CIRCULAR	16	26.1N 127.8E	67931	
105	151100	27.5N	126.1E	LAND			20711 72914	26.1N 127.8E	67931	
106	151100	27.5N	126.1E	LAND	POOR	CIRCULAR	16	26.1N 127.8E	67931	
107	151100	27.5N	126.1E	LAND	GOOD		18	26.3N 126.8E	67929	
108	151100	27.4N	126.0E	LAND			3//12 52714	26.4N 129.3E	67927	
109	151200	27.6N	125.9E	LAND			5//42 52908	26.1N 127.8E	67929	
110	151200	27.5N	125.8E	LAND			6//44 72912	26.1N 127.8E	67929	
111	151200	27.6N	125.9E	LAND	GOOD		15	26.1N 127.8E	67930	
112	151300	27.6N	125.7E	LAND			6//44 72916	26.1N 127.8E	67931	
113	151300	27.7N	125.6E	LAND			5//42 53012	26.1N 127.8E	67931	
114	151300	27.6N	125.7E	LAND	GOOD		13	26.1N 127.8E	67930	
115	151400	27.6N	125.4E	LAND			6//44 72911	26.1N 127.8E	67931	
116	151400	27.4N	125.3E	LAND	FAIR		3//12 52915	26.1N 127.8E	67931	
117	151400	27.7N	125.5E	LAND	FAIR		15	3//42 52911	26.1N 127.8E	67931
118	151500	27.6N	125.2E	LAND			6//44 73012	26.1N 127.8E	67931	
119	151500	27.7N	125.2E	LAND			6//44 73012	26.1N 127.8E	67931	
120	151500	27.7N	125.0E	LAND	FAIR		15	26.1N 127.8E	67930	
121	151600	27.8N	124.9E	LAND			5//42 52715	26.1N 127.8E	67931	
122	151700	27.7N	124.8E	LAND			5//41 53108	26.1N 127.8E	67929	
123	151800	28.0N	124.9E	LAND			5//42 53013	26.1N 127.8E	67929	
124	151900	28.0N	124.9E	LAND			5//42 52711	26.1N 127.8E	67929	
125	152000	28.1N	124.9E	LAND			5//42 53308	26.1N 125.3E	67927	

TROPICAL STORM DELTA

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACRY	JWTRAK CODE	SAT	COMMENTS	SITE
1	100210	19.5N 129.7E	PCN 5	TU+0/0+0	DMSH16	INIT JAS	PGT#
2	101200	19.5N 129.5E	PCN 5		DMSH16	CI UP	PGT#
3	102213	19.5N 129.4E	PCN 5	TU+0/0+0 / 50+0/20HRS	DMSH17		PGT#
4	111056	19.5N 129.4E	PCN 6		DMSH17	CI UP	PGT#
5	111142	19.5N 129.7E	PCN 5		DMSH16		PGT#
6	111139	19.5N 129.6E	PCN 5		DMSH15		PGT#
7	111139	19.5N 129.7E	PCN 5		DMSH15		RDN
8	112159	20.5N 129.0E	PCN 5	TL+0/1+0 / 01+0/24HRS	DMSH17		PGT#
9	112203	20.5N 129.7E	PCN 5		DMSH16		PGT#
10	112203	20.5N 129.8E	PCN 5	TL+0/1+0	DMSH16	INIT JAS	RPMK
11	120125	20.5N 129.6E	PCN 5		N08A8		PGT#
*	12 120316	22.5N 129.2E	PCN 5	TL+0/1+0	DMSH15	INIT JAS	RDN
13	120316	21.5N 129.5E	PCN 5		DMSH15		RPMK
*	14 121025	23.2N 129.7E	PCN 6		DMSH17	CI UP	PGT#
*	15 121125	23.5N 129.9E	PCN 5		DMSH16		PGT#
16	121559	24.5N 129.4E	PCN 5		DMSH17		RPMK
17	122134	24.5N 129.0E	PCN 5	T2.5/2.5+/01.5/24HRS	DMSH17		PGT#
*	18 130007	24.5N 129.6E	PCN 5	T3.5/3.5	DMSH16	INIT JAS	RKSD
19	130258	25.5N 129.1E	PCN 3	T3+0/3.0-/02.0/24HRS	DMSH16		RPMK
20	130259	24.5N 129.8E	PCN 5		DMSH15		PGT#
21	130259	25.5N 129.0E	PCN 3	T2.5/2.5+/01.5/24HRS	DMSH15		RDN
22	131120	26.5N 129.3E	PCN 5		N08A8		PGT#
23	131209	26.5N 129.1E	PCN 6		DMSH16		RDN
24	131500	26.7N 119.5E	PCN 6		DMSH16		PGT#

AIRCRAFT FIXES

FIA NO.	TIME (Z)	FLT	FLT LVL	HIV	HGS	MAX-SFC-WND	MAX-FLT-LVL-END	ACRY	EYE SHAPE	EYE DIAM-	EYE TEMP (C)	MV
1	110429	14.5N 129.1E	1500FT	999	60 090	15	PAR	60 150	10	2 2		01
2	120403	21.5N 124.4E	700MM	3031		50 050	25	IAN	58 050	25	+12 +16 +21	02
3	120424	21.5N 124.4E	700MM	3031							+14 +16 +20	02
*	4 120651	21.5N 124.5E	700MM	3035							+18 +18 +08	03
5	121505	22.5N 122.9E	700MM	3004	987	250	60 180	15	2 2		+18 +20 +06	03
6	121920	23.1N 122.1E	700MM	2990	984	210	35 110	20	5 5			

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACRY	EYE SHAPE	EYE DIA	RADAR-CODE	ANALYST-DIAFF	COMMENTS	RADAR POSITION	SITE
1	121700	22.5N 122.8E	LAND				25//3	51314		24,UN 121.6E	46699
2	121800	23.1N 122.6E	LAND				25//1	53114		24,UN 121.6E	46699
3	121900	23.2N 122.4E	LAND				25//3	53314		24,UN 121.6E	46699
4	122000	23.5N 122.4E	LAND				25//2	53615		24,UN 121.6E	46699
5	122100	23.4N 122.2E	LAND				25//3	52314		24,UN 121.6E	46699
6	122200	23.4N 122.4E	LAND				25//2	53415		24,UN 121.6E	46699
7	122300	23.5N 122.1E	LAND				25//3	53313		24,UN 121.6E	46699
8	130000	23.4N 122.2E	LAND				25//1	50217		24,UN 121.6E	46599
9	130100	24.1N 122.1E	LAND				10572	50515		24,UN 121.6E	46599

TROPICAL DEPRESSION 14

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	UVYTRAK CODE	SAT	COMMENTS	SITE
1	132200	14.4N 139.4E	PCV N	TU.0/0.0	NDSAS	INIT J45	PGT#
2	141141	14.4N 139.4E	PCV N	TU.0/0.0	DNSP24	CI J004	PGT#
3	150041	14.4N 139.4E	PCV S	TU.0/0.0 /50.0/24HRS	DNSP24	PGT#	
4	151320	14.4N 139.4E	PCV S	TU.0/0.0	NDSAS	CI UP	PGT#
5	151323	14.4N 139.4E	PCV S	TU.0/0.0	DNSP24	PGT#	
6	160023	14.4N 139.4E	PCV S	TU.0/0.0 /50.0/24HRS	DNSP24	PGT#	
7	171147	14.4N 139.4E	PCV S	TU.0/1.0 /01.0/24HRS	DNSP24	PGT#	
8	171150	14.4N 139.4E	PCV S	TU.0/1.0	DNSP24	PGT#	
9	171153	14.4N 139.4E	PCV S	TU.0/1.0 /50.0/19HRS	DNSP24	PGT#	
10	180124	27.2N 139.4E	PCV N	TU.0/0.0	DNSP24	PGT#	
* 11	181120	24.4N 139.4E	PCV N	TU.0/0.0	DNSP24	PGT#	
12	181123	24.4N 139.4E	PCV N	TU.0/0.0	NDSAS	PGT#	
13	181124	24.4N 139.4E	PCV N	TU.0/0.0	DNSP24	PGT#	
* 14	182113	25.1N 139.4E	PCV S	TU.0/2.0 /01.0/24HRS	DNSP27	PARTIALLY EXPOSED LLC#	
15	182223	25.1N 139.4E	PCV S	TU.0/2.0	DNSP24	PGT#	
16	190004	26.4N 139.4E	PCV S	TU.0/2.0	NDSAS	PGT#	
17	191300	27.4N 139.4E	PCV S	TU.0/2.0	DNSP24	PGT#	
18	191300	27.4N 139.4E	PCV S	TU.0/2.0	CI J004	PGT#	
19	191347	27.4N 139.4E	PCV S	TU.0/2.0	DNSP24	RK50	
20	191350	24.4N 139.4E	PCV S	TU.0/2.0	DNSP24	PGT#	
21	192054	30.4N 139.4E	PCV S	TU.5/2.5 /00.5/24HRS	DNSP27	PGT#	
22	192354	30.4N 139.4E	PCV S	TU.0/2.0	DNSP27	INIT J45	RK50
23	192357	30.4N 139.4E	PCV S	TU.0/2.0	DNSP27	INIT J45	R004
24	192205	30.4N 139.4E	PCV S	TU.0/2.0	DNSP24	PGT#	
25	192323	30.4N 139.4E	PCV S	TU.0/2.0	NDSAS	PGT#	
26	200059	31.2N 139.4E	PCV S	TU.0/2.0	DNSP24	PGT#	
27	201235	31.7N 139.4E	PCV S	TU.0/2.0	DNSP24	PGT#	
28	201235	31.7N 139.4E	PCV S	TU.0/2.0	DNSP24	RK50	
29	201440	31.2N 139.4E	PCV S	TU.0/2.0	DNSP27	PGT#	
30	200240	33.4N 139.4E	PCV N	TU.0/2.0	DNSP24	R004	

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	MIN HGT	MSL	MAX-SFC-END VEL/HGT/HNG	MAX-FLT-LVL-END DTH/VEL/BHG/HNG	ACCRY	EYE SHAPE	EYE ORIEN- DIAM/TATION	EYE TEMP (C) MMF/ IN/ DP/SST	MSV NU.
1	141350	24.4N 139.4E	700MB	1103	1002		100	48 080	95	5 3	+11 +10 + R	2
2	190135	27.4N 139.4E	700MB								+24 +26 +26	3
3	191329	25.1N 139.4E	700MB	1004	998	50 300	15	080 50 300	15	2 3	+10 +10 +10	4
* 4	191326	27.2N 139.4E	700MB	1116				090 38 090	40	13 4	+26 +17	5
5	200240	31.2N 139.4E	1500FT		1006	20 130	40	250 35 130	40	5 20		

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR	ACCRY	EYE SHAPE	EYF DIAM	RADAR-CODE ARMW TDFF	COMMENTS	RADAR POSITION	RADAR NO.
1	200700	33.2N 139.4E	LAND				53627 /999/		33.3N 139.2E	47889
2	200500	33.4N 139.4E	LAND				53727 50127		33.3N 139.2E	47889

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TYPHOON ELAINE

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	UVTRAK CODE	SAT	COMMENTS	SITE
1	140305	9.24 133.2E	PCN 5	T0+020.0	N0045	INIT JHS	PGT#
2	210034	13.29 130.1E	PCN 5	T0+020.0 /50+0/25HRS	N0045		PGT#
3	211114	15.24 129.3E	PCN 5		N0045	C1 UP	PGT#
4	212325	17.34 129.2E	PCN 5	T0+020.0 /50+0/25HRS	N0045		PGT#
5	221230	17.34 129.2E	PCN 5		N0045		PGT#
6	222225	17.34 129.0E	PCN 5	T0+020.0	DMS036	INIT JHS PENETRATING CDS	RPMK
7	230105	17.34 129.4E	PCN 5	T1+01.0 /01+0/25HRS	N0045	PENETRATING CDS AT 18.2N 123.8E	PGT#
8	211303	16.84 121.4E	PCN 5		DMS037	C1 UP	PGT#
9	211305	16.84 121.4E	PCN 5		DMS037		RODN
10	231205	16.84 120.4E	PCN 5		DMS037		PGT#
11	231145	16.84 120.4E	PCN 5		N0045		RPMK
12	231505	17.74 121.4E	PCN 5		DMS037		RODN
13	231505	17.74 120.4E	PCN 5		DMS037		PGT#
14	232305	16.84 120.7E	PCN 5	T2+020.0	DMS037	INIT JHS SECONDARY 17.8N 121.4E	RODN
15	240020	17.74 120.4E	PCN 5		DMS036	PSBL SECONDARY CC 17.6N 120.7E	RPMK
16	240020	17.51 120.4E	PCN 5		DMS037		RODN
17	240022	17.51 121.4E	PCN 5	T2+020.0 /01+0/25HRS	N0045		PGT#
18	240023	17.51 120.4E	PCN 5		DMS035		PGT#
19	241153	17.51 120.4E	PCN 5		DMS037		RODN
20	241155	17.51 119.5E	PCN 5		DMS037		RPMK
21	241250	17.51 119.4E	PCN 5		N0045		PGT#
22	241302	17.51 119.4E	PCN 5		DMS036	SECONDARY CC 17.8N 119.1E	RPMK
23	241307	17.44 119.4E	PCN 5		DMS035	SECONDARY CC 16.9N 118.9E	RODN
24	242245	17.44 119.4E	PCN 5	T3+023.0 /01+0/25HRS	DMS037		RODN
25	250002	17.44 119.4E	PCN 5	T3+023.0	DMS036	INIT JHS	RPMK
26	250003	17.44 119.4E	PCN 5		DMS036		RODN
27	251133	17.44 119.5E	PCN 5	T2+5/2.5 /00+0/25HRS	N0045		PGT#
28	251152	17.44 117.4E	PCN 5		DMS037		RPMK
29	251211	16.44 117.4E	PCN 5		N0045		PGT#
30	251215	17.44 117.4E	PCN 5		DMS036	LW LVL CIRCULATION	RPMK
31	251249	17.44 117.4E	PCN 5		DMS035		PGT#
32	252225	17.44 117.2E	PCN 5	T3+5/2.5 /01+0/25HRS	DMS037		PGT#
* 33	252225	17.44 117.4E	PCN 5	T3+023.0 /50+0/25HRS	DMS037		RPMK
* 34	252345	17.44 117.4E	PCN 5	T3+023.0 /50+0/25HRS	DMS036		RODN
35	252345	17.44 117.2E	PCN 5		DMS036		PGT#
36	260051	14.44 117.0E	PCN 4		N0045		PGT#
37	260230	14.44 116.3E	PCN 3		DMS035		PGT#
38	260230	14.71 116.3E	PCN 3		DMS035		RPMK
39	261107	14.44 115.6E	PCN 3		DMS037		RODN
40	261130	10.2N 115.6E	PCN 6		N0045		PGT#
41	261227	19.4N 114.4E	PCN 5		DMS036		RPMK
42	261512	20.4N 114.4E	PCN 3		DMS035		PGT#
43	261512	19.4N 114.4E	PCN 3		DMS035		RPMK
44	261554	20.4N 114.4E	PCN 4		DMS035	BASED ON CONTINUITY	PGT#
45	262205	20.1N 113.3E	PCN 5		DMS037		PGT#
46	262328	20.2N 113.3E	PCN 5	T4+024.0 /00+0/25HRS	DMS036		PGT#
47	270359	20.4N 112.3E	PCN 5	T3+05.0 /02+0/25HRS	DMS035		RPMK
48	271047	21.4N 110.4E	PCN 4		DMS037		PGT#
49	271047	21.4N 110.4E	PCN 4		DMS037		RPMK
50	271209	21.4N 108.4E	PCN 4		DMS036		PGT#
51	271555	21.4N 108.7E	PCN 5		DMS037	EYE GONE	RPMK
52	280119	21.7N 108.6E	PCN 5		N0045		PGT#

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FLX POSITION	FLX LVL	MIV HGT	DBS MSLP	MAX-SFC-WND MAX-FLT-LVL-IND ACCRY	EYE SHAPE	EYE ORIENT- DIA/TATION	EYE TEMP (C) UNITS IN/DP/SST	MSN NO.
1	240034	17.4N 120.3E	700MB	2993		50 010 50 000 61 010 120			+12 +12	1
2	24n230	17.4N 120.2E	700MB	2995		40 330 50 000 50 320 130 2 5			+12 +12 +12	1
3	241255	16.4N 119.1E	700MB							
4	241345	16.4N 119.1E	700MB	2976		020 42 300 155 2 7			+11 +13 +11	2
5	250353	17.4N 119.1E	700MB	2961	381	30 160 120 260 48 160 120 5 10			+26 +26	3
6	250532	17.4N 117.4E	700MB							
7	250535	17.4N 117.4E	700MB	2926	381	40 200 35 270 45 200 45 10			+14 +14 +11	3
8	251504	17.2N 118.1E	700MB	2897	977	220 43 150 75 20 8			+12 +14 +1n	4
9	251338	17.4N 117.4E	700MB	2885	977	310 40 250 120 25 5			+12 +16 +1n	4
10	252225	18.2N 117.0E	700MB	2882	975	360 40 230 60 15 3			+12 +16 +12	4
11	261028	19.2N 115.5E	700MB	2867	970	45 120 125 180 55 110 60 2 5			+12 +15 +14	27
12	261330	19.4N 114.4E	700MB	2867		170 68 270 105			+13 +13	5

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WAJAH FIXES

FIX NO.	TIME (Z)	FIX POSITION	MADAR	ACOMY	EYE SHAPE	EYF	RADOM-CODE DIAM	ASWAN TUFF	COMMENTS	MADAR POSITION	SITE WNO NO.
*	1 231200	19.6N 121.5E	LAND			2221/ 627//				16.3N 120.6E	98321
*	2 231300	19.6N 121.3E	LAND			2212/ 627//				16.3N 120.6E	98321
*	3 231700	19.6N 120.6E	LAND			29// //				16.3N 120.6E	98321
*	4 240001	17.6N 120.3E	LAND			1060// //				16.3N 120.6E	98321
*	5 240200	17.3N 120.2E	LAND			1152/ 6215				16.3N 120.6E	98321
b	240505	17.3N 119.7E	LAND					PSHL CNTK		16.0N 120.3E	
7	240530	17.3N 120.0E	LAND			1012/ 73608				16.3N 120.6E	98321
8	240800	17.5N 119.7E	LAND			1119/ 10413				16.3N 120.6E	98321
y	241700	17.2N 118.7E	LAND			45// 9//				16.3N 120.6E	98321
10	250015	16.5N 119.4E	LAND	CIRCULAR	PI	EYE				16.0N 120.3E	
11	250230	17.5N 118.2E	LAND			4// //				16.3N 120.6E	98321
12	250335	16.3N 119.5E	LAND			4// //				16.0N 120.3E	
13	250730	17.2N 117.6E	LAND			4// //				16.3N 120.6E	98321
14	250930	17.2N 117.6E	LAND			4// //				16.3N 120.6E	98321
15	251330	17.1N 117.4E	LAND			4// //		10DEG SPHL OVERLAY		16.3N 120.6E	98321
16	262240	19.9N 113.1E	LAND			30902 52710				16.3N 120.6E	98321
17	262350	20.0N 112.9E	LAND			30912 53110				22.3N 114.2E	45005
18	270003	20.1N 112.7E	LAND			2091/ 52914				22.3N 114.2E	45005
19	270130	20.1N 112.6E	LAND			20912 52907				22.3N 114.2E	45005
20	270300	20.3N 112.4E	LAND			20912 53210				22.3N 114.2E	45005
21	270400	20.6N 112.0E	LAND			20912 63117				22.3N 114.2E	45005
22	270500	20.9N 111.8E	LAND			20912 63211				22.3N 114.2E	45005
23	270800	21.3N 111.5E	LAND			20912 63215				22.3N 114.2E	45005
24	270900	21.4N 111.3E	LAND			20942 63213				22.3N 114.2E	45005

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DO NOT RELEASE UNTIL 10 MAY 1970

TYPHON PAYE

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	OVERAK CODE	SAT	COMMENTS	SITE
1	24192	5.4N 160.4E	PCN 6	TU+0/0+0	NNAAS	INIT JHS	
2	251017	7.3N 157.4E	PCN 6		NNAAS		PGT#
3	252254	6.5N 155.4E	PCN 6	TU+0/0+0 /SO+0/25HRS	NNAAS		PGT#
4	260936	7.3N 152.4E	PCN 6		NNAAS		PGT#
5	271029	10.5N 149.4E	PCN 6		DNSP16		PGT#
6	271229	12.7N 146.4E	PCN 3	T1+0/1+0	DNSP16	INIT JHS	PGT#
7	273323	12.7N 145.4E	PCN 3		NNAAS		PGT#
8	280105	13.5N 146.0E	PCN 5		DNSP17		PGT#
9	280346	14.5N 145.0E	PCN 6		DNSP17	CL UP	PGT#
10	281011	14.4N 145.0E	PCN 5		DNSP17		PGT#
11	281437	14.1N 144.7E	PCN 6		DNSP17		PGT#
12	282127	16.3N 145.4E	PCN 5	T3+5/3+5 /D0+5/24HRS	DNSP17		PGT#
13	282253	16.5N 145.4E	PCN 5		DNSP17		PGT#
14	290137	17.0N 145.2E	PCN 5		DNSP17		PGT#
15	290827	17.3N 145.4E	PCN 6		DNSP17	CL SAME	PGT#
16	291953	14.0N 145.2E	PCN 6		DNSP17		PGT#
17	291613	14.4N 145.7E	PCN 6		DNSP17		PGT#
18	292108	19.3N 146.3E	PCN 5	T3+5/3+5 /SO+0/24HRS	DNSP17		PGT#
19	292108	19.3N 146.5E	PCN 3	T3+5/3+5	DNSP17		PGT#
20	292236	19.4N 146.4E	PCN 5		DNSP17	INIT JHS	RPMK
21	300948	14.5N 147.4E	PCN 6		DNSP17		PGT#
22	303322	19.3N 147.4E	PCN 5		DNSP17	CL SAME	RKS0
23	301118	19.3N 148.1E	PCN 5		DNSP17		PGT#
24	301401	19.0N 148.3E	PCN 6		DNSP17		PGT#
25	302048	17.9N 148.5E	PCN 5	T3+5/3+5 /SO+0/24HRS	DNSP17		PGT#
26	302048	18.2N 149.1E	PCN 3	T3+0/3+0	DNSP17	INIT JHS	RODN
27	302218	17.9N 149.4E	PCN 4		DNSP17		PGT#
28	310929	17.4N 149.0E	PCN 5		DNSP17		RKS0
29	310929	17.3N 149.0E	PCN 6		DNSP17		PGT#
30	310929	17.5N 149.0E	PCN 6		DNSP17		RODN
31	311100	17.9N 149.4E	PCN 5		DNSP17		PGT#
32	311343	17.1N 147.7E	PCN 3		DNSP17		PGT#
33	312028	16.9N 147.5E	PCN 3	T4+0/4+0 /D0+5/24HRS	DNSP17	EXPOSED LOW LVL	PGT#
34	312201	17.6N 147.5E	PCN 3		DNSP17		PGT#
35	010043	16.7N 147.2E	PCN 3		DNSP17		PGT#
36	010910	17.4N 146.8E	PCN 5		DNSP17	CL UP	PGT#
37	010910	17.3N 146.0E	PCN 6		DNSP17		RODN
38	011043	17.5N 146.1E	PCN 5		DNSP17		PGT#
39	011325	17.3N 146.6E	PCN 5		DNSP17		PGT#
40	012009	19.5N 145.0E	PCN 2	T4+5/4+5 /D0+5/24HRS	DNSP17		PGT#
41	012143	14.9N 144.9E	PCN 1		DNSP17		PGT#
42	020207	19.3N 144.6E	PCN 1		DNSP17		PGT#
43	020950	20.2N 141.7E	PCN 2		DNSP17		PGT#
44	020950	19.9N 141.2E	PCN 6		DNSP17		PGT#
45	021026	20.4N 141.0E	PCN 1		DNSP17		RODN
46	021449	20.4N 141.6E	PCN 5		DNSP17		PGT#
47	022126	21.9N 141.0E	PCN 2		DNSP17		PGT#
48	022308	22.0N 141.4E	PCN 4		DNSP17		PGT#
49	030119	22.4N 140.7E	PCN 4	T3+0/5+0 /D0+5/30HRS	DNSP17		PGT#
50	031012	23.5N 139.4E	PCN 6		DNSP17		PGT#
51	031012	23.4N 139.2E	PCN 6		DNSP17		RKS0
52	031150	24.0N 139.4E	PCN 6		DNSP17		PGT#
53	031150	24.0N 139.2E	PCN 5		DNSP17		RODN
54	031431	24.4N 139.2E	PCN 5		DNSP17		PGT#
55	032112	25.2N 137.3E	PCN 5	T3+5/4+5 /W1+5/19HRS	DNSP17		PGT#
56	032251	25.5N 137.7E	PCN 5	T4+0/4+0	DNSP17	INIT JHS	RKS0
57	032251	25.5N 137.0E	PCN 5		DNSP17		PGT#
58	040131	26.2N 136.4E	PCN 3		DNSP17		RKS0
59	040131	26.1N 136.6E	PCN 3		DNSP17		PGT#
60	040953	27.6N 135.4E	PCN 4		DNSP17		RKS0
61	040953	27.5N 135.5E	PCN 4		DNSP17	CENTER OF CDO	PGT#
62	041133	27.9N 135.4E	PCN 5		DNSP17		PGT#
63	041413	28.2N 134.4E	PCN 5		DNSP17		PGT#
64	042053	28.7N 134.8E	PCN 5	T3+0/3+5 /W0+5/24HRS	DNSP17		PGT#
65	042233	28.4N 134.8E	PCN 3	T3+5/4+0 /W0+5/24HRS	DNSP17		RKS0
66	042233	28.9N 134.7E	PCN 5		DNSP17		PGT#
67	050936	30.4N 135.4E	PCN 6		DNSP17		RKS0
68	050936	29.4N 135.5E	PCN 6		DNSP17		PGT#
69	051115	30.2N 136.5E	PCN 5		DNSP17		PGT#
70	051356	30.0N 136.5E	PCN 5		DNSP17	CL UP	PGT#
71	051356	29.9N 136.5E	PCN 5		DNSP17		RODN
72	052033	30.1N 137.4E	PCN 4	T3+0/3+0 /SO+0/24HRS	DNSP17		PGT#
73	052033	33.0N 137.9E	PCN 3	T3+5/3.5+5/SO+0/22HRS	DNSP17		RKS0
74	052216	30.1N 138.4E	PCN 5		DNSP17		PGT#
75	060056	30.2N 138.3E	PCN 5		DNSP17		RKS0
76	060056	30.0N 138.0E	PCN 3		DNSP17		PGT#
77	060314	30.1N 139.4E	PCN 5		DNSP17	CL DOWN	PGT#
78	060314	30.0N 139.3E	PCN 6		DNSP17		RODN
79	061058	30.0N 139.5E	PCN 5		DNSP17		PGT#
80	061339	29.9N 139.4E	PCN 5		DNSP17		PGT#
81	061519	29.3N 141.3E	PCN 6		DNSP17		RODN
82	062014	30.6N 140.1E	PCN 3	T2+5/3+0 /W0+5/24HRS	DNSP17		PGT#
83	062014	30.4N 140.3E	PCN 3	T2+5/3.5 /W1+0/24HRS	DNSP17		RKS0
84	062158	30.7N 140.3E	PCN 3		DNSP17		PGT#
85	070038	30.7N 140.4E	PCN 3		DNSP17		PGT#
86	070219	30.6N 140.6E	PCN 4		DNSP17		KGWC
87	070219	30.6N 140.6E	PCN 4		DNSP17		KGWC
88	071028	30.5N 141.2E	PCN 4		NNAAS	CL DOWN	PGT#
89	071036	30.2N 140.9E	PCN 6		DNSP17		RODN
90	071502	30.5N 141.8E	PCN 4		DNSP17		PGT#
91	071502	30.1N 141.6E	PCN 5		DNSP17		RODN
92	072136	30.3N 142.5E	PCN 3		DNSP17		PGT#
93	072141	30.4N 142.4E	PCN 3		DNSP17		PGT#

STORM TRACK FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	HT	MSLP	MAX-SFC-HND VEL/HNG/RHG	MAX-FLT-LVL-HND DIA/VEL/RHG/ANG NAV/HGT	ACCRY	EYE SHAPE	EYE DIAM/ORIENTATION	EYE TEMP (C)	HGT IN/ DB/SST	MSL
1	272253	12.5N 145.3E	1500FT	1000	45	110	55	100 48 110 55	S S	+23 +26	30		1
2	280158	13.2N 144.0E	1500FT	997	25	100	45	200 30 100 65	S S	+24 +26	30		2
3	281535	13.4N 144.9E	700MH	3095	1001			200 30 250 3n	S S	+21 +15 + 7			
4	281527	13.4N 145.0E	700MH	3091				000 30 300 3n	S S	+ 15+ 6			2
5	282102	13.2N 145.1E	700MH	3094	1001	50	100	15 070 29 300 6n	S S	+14 +15 + 7			
6	290100	13.4N 145.0E	700MH	3125		50	050	40 100 43 050 4n		+ 15+ 12			3
7	290326	13.3N 145.1E	700MH	3100	1002	35	310	45 030 20 310 37	S 2	+15 +20 +11			3
8	291503	13.2N 145.0E	700MH	3053	096			350 35 270 3n	S 2	+13 +20 + 9			4
9	300034	13.2N 145.0E	700MH			50	300	20 170 55 030 1%					5
10	301332	13.2N 147.0E	700MH	3055	084	60	020	15 140 65 020 1%	S 2	+14 +16 + 9 28			5
11	301205	13.0N 147.9E	700MH	3051				310 49 210 6n		+16 + 6			6
12	301452	13.3N 146.3E	700MH	3100	1002			010 38 270 6n	10 10	ELLIPICAL 50 20 090	+12 +12 +11		6
13	302390	13.6N 146.6E	700MH	3069	987	35	120	35 320 45 120 3%		+16 + 7			7
14	311360	13.3N 144.8E	700MH	3074	987	50	240	20 350 50 270 1%	S 1	+11 +19 + 7			7
15	311202	13.4N 146.7E	700MH	3094				100 45 360 2n		+19 + n			8
16	311442	13.3N 146.3E	700MH	3074	986			350 45 280 2n	S S	+11 +17 +15			8
17	312052	13.0N 147.7E	700MH	3094	987	50	090	10 240 38 160 15	S S	+10 +15 +11 20			9
18	010835	16.3N 147.3E	700MH	2982		50	010	10 110 52 010 2n		+ 15+ 11			9
19	010333	17.0N 147.0E	700MH	2919	981	95	300	10 240 62 290 1n	S S	+12 +15 +11			9
20	011521	13.0N 145.6E	700MH	2821	069			210 77 170 1n	S 2	+12 +14 +11			10
21	011530	13.5N 145.3E	700MH	2770				170 95 140 17	CIRCULAR 15	+ 15+ 13			10
22	012031	14.7N 144.1E	700MH	2949	981	40	180	50 010 75 280 1n	S 2	+10 +15 +11			10
23	020846	19.1N 144.8E	700MH	3061	949	40	230	50 310 80 230 15	S 2	ELLIPICAL 15 12 040	+13 +17 +17		11
24	020339	19.5N 144.5E	700MH	3057	939	130	270	7 310 100 270 1n	S 1	CIRCULAR 15	+12 +19 +16		11
25	021503	21.3N 141.1E	700MH	3522	936			270 94 180 15	20 2	CIRCULAR 12	+12 +19 +16		12
26	021533	21.0N 142.9E	700MH	3524				090 103 350 5		+ 19+ 19			12
27	022042	21.8N 141.8E	700MH	3542	937			290 93 210 6	S 2	+12 +19 +14			12
28	030053	22.2N 141.1E	700MH	3651	950								13
29	070340	22.8N 140.6E	700MH	3746	961	100	360	10 110 122 360 10	S S	+13 +15 +14			13
30	031513	24.7N 134.2E	700MH	3000	990			190 61 110 55	S 5	ELLIPICAL 30 20 150	+12 +20 + 8		14
31	012118	25.5N 137.3E	700MH	3104	991	50	090	20 120 58 090 2n	S 10	+15 +11 +11			14
32	040108	24.1N 136.5E	700MH	3054	954	50	050	20 190 55 120 6n		+16			15
33	040339	24.6N 136.1E	700MH	3074	987	55	310	65 070 35 310 4n	S 3	+15 +19			15
34	041555	24.2N 134.7E	700MH	3014	989			200 52 140 3n	2 5	+12 +18 +11			16
35	041501	24.2N 134.6E	700MH	3074				160 65 040 6n		+ 18+ 9			16
36	042057	24.8N 134.7E	700MH	3077	985	35	360	15 010 35 300 2n	S 2	+13 +18 +11			16
37	050030	29.2N 134.5E	700MH	3022		40	090	20 140 54 090 3n		+16			17
38	050315	29.5N 135.1E	700MH	3003	979	30	330	30 010 69 330 2n	S 3	CIRCULAR 25	+12 +16		17
39	051233	30.0N 134.6E	700MH	3094				180 70 120 2n		+17 +17 +11			18
40	051541	31.3N 134.4E	700MH	3077	972			010 80 280 1n	S 3	CIRCULAR 17	+19 +20 +16		18
41	060040	30.3N 134.3E	700MH	3066	975	80	270	5 70		+25 + 0			19
42	060320	30.4N 134.6E	700MH	3070	975	100	040	25 140 65 040 3n	2 2	+16 +21 + 8			20
43	062356	30.7N 140.6E	700MH			30	0	31					20
44	070036	30.8N 140.5E	700MH	3104	1002	25	240	50 320 61 240 9n	S 2	+17 +18 + 0			20
45	070302	30.7N 140.7E	700MH	3084	1000	35	010	120 090 20 010 6n	S 3	+17 +18 + 0			20

RADAR FIXES

FIX NO.	TIME (Z)	RADAR POSITION	ACCRY	EYE SHAPE	EYE DIAM	RADAR-CODE SWAN TOOKF	COMMENTS	RADAR POSITION	RADAR SWAN NO.
1	272330	12.7N 146.1E	LAND				1 HAN1 40NN	13.6N 146.9E	01218
2	280125	13.2N 145.7E	LAND				Poorly defined spiral band	13.6N 146.9E	01218
3	280235	13.3N 145.5E	LAND				Feeden bands appear weaker	13.6N 146.9E	01218
4	280310	13.4N 145.7E	LAND	030R			PSRL CNTR	13.6N 146.9E	01218
5	280335	13.5N 145.7E	LAND	030R	CIRCULAR	20	PSRL CNTR WALL CLD OPEN S-N	13.6N 146.9E	01218
6	280410	13.7N 145.6E	LAND	030R	CIRCULAR	15	PSRL CNTR WALL CLD OPEN SE-N	13.6N 146.9E	01218
7	280435	13.4N 145.5E	LAND	030R	ELLIPICAL		PSRL CNTR WALL CLD OPEN SE-N	13.6N 146.9E	01218
8	280510	13.9N 145.5E	LAND	030R			PSRL CNTR	13.6N 146.9E	01218
9	281310	14.3N 145.2E	LAND	FAIR	CIRCULAR	25	PSRL EYE	13.6N 146.9E	01218

TROPICAL STORM GLORIA

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	JWDRAK CODE	SAT	COMMENTS	SITE
1	281512	21.2N 122.4E	PCN 5		DNSP16		PGTM
2	273110	17.5N 120.4E	PCN 5	T1+0/1+0	DNSP16	INIT JJS	RQV
3	281522	21.1N 120.4E	PCN 5	T1+0/1+0	DNSP16	INIT JJS	PGTM
4	281028	19.4N 124.4E	PCN 5		DNSP17	CL JP	PGTM
5	281122	19.5N 124.4E	PCN 5		DNSP16	SECUNDARY 22.3N 128.0E	PGTM
6	281437	14.4N 128.0E	PCN 5		DNSP16		PGTM
7	281227	21.1N 126.4E	PCN 5		DNSP17	SECUNDARY 22.2N 129.4E	PGTM
8	282253	23.2N 129.0E	PCN 5	T1+0/1+0	DNSP16	INIT JJS	RKSD
9	282253	23.2N 129.4E	PCN 5	T1+0/1+0	DNSP16	INIT JJS	RPMK
10	282253	23.2N 129.4E	PCN 5	T2+0/2+0 /01.0/21HRS	DNSP16	SECUNDARY 20.0N 126.0E	PGTM
11	290105	23.0N 128.4E	PCN 5		DNSP16	SECUNDARY 22.3N 130.0E	PGTM
12	290137	21.4N 128.4E	PCN 5		DNSP16	SECUNDARY 22.4N 130.4E	RPMK
13	290137	21.4N 128.4E	PCN 5		DNSP16	SECUNDARY 22.4N 129.4E	PGTM
14	291008	23.3N 129.4E	PCN 5		DNSP17		RKSD
15	291008	23.3N 129.4E	PCN 5		DNSP17		RPMK
16	291008	23.1N 127.4E	PCN 5		DNSP17	CL SAME	PGTM
17	291123	22.0N 127.4E	PCN 5		DNSP16		PGTM
18	291619	22.0N 127.4E	PCN 5		DNSP16		PGTM
19	291500	21.0N 126.0E	PCN 5		DNSP16		RPMK
20	291008	21.0N 129.0E	PCN 5	T2+0/2+0 /01.0/22HRS	DNSP17		RKSD
21	291008	21.0N 129.4E	PCN 5	T2+0/2+0 /01.0/23HRS	DNSP17		RPMK
22	291008	24.0N 128.4E	PCN 5	T2+0/2+0 /00.5/22HRS	DNSP17		PGTM
23	291235	24.1N 128.4E	PCN 5		DNSP16		PGTM
24	300949	24.0N 127.4E	PCN 4		DNSP17		RKSD
25	300949	24.0N 128.4E	PCN 5		DNSP17	CL SAME	PGTM
26	301118	25.1N 129.4E	PCN 5		DNSP16		PGTM
27	301502	25.3N 129.4E	PCN 4		DNSP16		RPMK
28	302218	27.5N 130.4E	PCN 3		DNSP16		PGTM
29	302230	27.4N 130.4E	PCN 3	T2+0/2+0 /#0.5/24HRS	DNSP17		RPMK
30	302230	27.4N 130.4E	PCN 3		DNSP17		RKSD
31	310242	27.4N 130.0E	PCN 3		DNSP16	SECUNDARY 31.3N 134.7E	RPMK
32	310242	27.7N 129.4E	PCN 3		DNSP16		PGTM
33	310243	27.5N 130.0E	PCN 5		DNSP17		RKSD
34	311100	24.4N 130.4E	PCN 5		DNSP16		PGTM
35	311242	24.0N 130.4E	PCN 6		DNSP16		RPMK
36	312201	27.4N 131.4E	PCN 5		DNSP16		PGTM
37	312210	27.7N 131.4E	PCN 5		DNSP17		RKSD

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	MIV HGT	MISL	MAX-SFC-HND	MAX-FLT-LVL-HND	ACCRY	EYE SHAPE	EYE DIREC-	EYE TEMP (C)	NSN NO.	
1	290117	21.1N 129.4E	1500FL		998	25 360	70	040	24 300	70	+26 +26	3	
2	290231	21.3N 129.4E	700MH	7057	996	25 020	50	040	24 020	50	+11 +10	1	
3	291437	22.5N 127.4E	700MH	7036	994				20 300	40	+11 +13 +16	2	
4	300540	24.7N 129.4E	700MH	7000	990	25 180	35	200	29 210	60	+13 +14 +9	3	
5	301400	25.4N 129.4E	700MH	7013					210	27 120	90	+14 +9	4
6	301530	26.2N 129.4E	700MH	7045	995				230	36 120	150	+15 +14 +5	5
7	310408	27.7N 130.4E	700MH	7039	993	15 270	35	200	15 110	30	+13 +13 +17	6	

TROPICAL STORM HESTER

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVDRAK CODE	SAT	COMMENTS	SITE
1	281011	27.2N 150.4E	PCV 5		DNSP16	UPPER LVL POSITION	POTW
2	281937	28.0N 150.3E	PCV 6	T1+0/1+0	DNSP16	UPPER LVL POSITION	POTW
3	290137	29.4N 149.3E	PCV 6		DNSP15	INIT JAS	POTW
4	290827	29.6N 149.5E	PCV 6		DNSP17	CL UP	POTW
5	290953	29.3N 149.4E	PCV 6		DNSP16		POTW
6	291619	30.3N 149.0E	PCV 6		DNSP16	UPPER LVL	POTW
7	291925	30.4N 149.6E	PCV 6		DNSP17		POTW
8	292054	31.1N 150.1E	PCV 5	T2+0/2+0 /01+0/14HRS	DNSP16		POTW
9	292108	31.1N 150.1E	PCV 6		DNSP17		POTW
10	300949	32.6N 150.3E	PCV 4		DNSP17		RNSO
11	300949	32.4N 150.5E	PCV 3		DNSP17	CL UP	POTW
12	301118	31.1N 150.3E	PCV 2		DNSP16		RDN
13	301118	32.0N 150.7E	PCV 1		DNSP16		POTW
14	301401	31.2N 150.4E	PCV 2		DNSP15		POTW
15	301402	32.3N 150.4E	PCV 4		DNSP15		RNSO
16	301905	33.6N 151.1E	PCV 4		DNSP17		KGWC
17	302046	34.2N 151.9E	PCV 1	T3+0/3+0	DNSP17	INIT JAS	RDN
18	302046	34.0N 151.8E	PCV 2	T3+0/3+0 /01+0/24HRS	DNSP17		POTW
19	310101	34.2N 152.5E	PCV 1		DNSP15		RNSO
20	310101	34.2N 152.4E	PCV 2		DNSP15		RDN
21	310101	34.0N 152.2E	PCV 1		DNSP15		POTW
22	310929	34.1N 155.0E	PCV 2		DNSP17		RNSO
23	311103	34.6N 155.7E	PCV 2		DNSP16		POTW
24	311343	37.2N 156.8E	PCV 2		DNSP15		POTW
25	311343	37.7N 156.8E	PCV 2		DNSP15		KGWC
26	311947	34.2N 150.8E	PCV 4	T3+0/3+0	DNSP17	INIT JAS	KGWC
* 27	312029	34.7N 156.8E	PCV 5		DNSP17	LOW/MID LVL FEATURE	RNSO
28	312301	41.1N 151.5E	PCV 4		DNSP15		KGWC
29	010043	40.5N 156.1E	PCV 6		DNSP15		POTW
* 30	010910	51.5N 174.5E	PCV 6		DNSP17		KGWC
31	010910	47.0N 149.0E			DNSP		KGWC

AIRCRAFT FIXES

FIX NO.	TIME	FIX POSITION	FLT LVL	RIN	DBS	MAX-SFC-4RD	MAX-FLT-LVL-4RD	ACCRY	EYE SHAPE	EYE DIREC- TION/TINT	EYE TEMP (C) OUT/ IN/ JAS/SST	MSV NO.
1	291909	30.3N 149.6E	700NM	1000	399				RAD	36 320 21 N S	616 + R	1

TYphoon IRMA

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	UVTRAK CODE	SAT	COMMENTS	SITE
1	091147	19.5N 126.7E	PCN 5		DNSP16		PGT#
2	092248	21.4N 123.9E	PCN 5	T1+0/1.0	DNSP16	INIT JHS	PGT#
3	101130	21.2N 121.2E	PCN 5		DNSP16		PGT#
4	102214	21.7N 121.3E	PCN 5	T1.5/1.5	DNSP17	INIT JHS	RPMK
5	110012	22.0N 121.3E	PCN 5		DNSP17		RPMK
6	110250	22.3N 121.3E	PCN 5		DNSP17		PGT#
7	111024	23.0N 122.3E	PCN 5		DNSP17		PGT#
8	111219	23.4N 122.7E	PCN 5	T2.5/2.5	DNSP17	INIT JHS	RDN
9	111559	24.4N 122.9E	PCN 5	T2.5/2.5	DNSP17	INIT JHS	PGT#
10	121040	25.5N 123.8E	PCN 6		DNSP17		PGT#
11	121227	25.4N 123.6E	PCN 5		DNSP16		RPMK
12	121514	26.2N 123.5E	PCN 2		DNSP15		RHSO
13	121514	26.1N 123.6E	PCN 4		DNSP15	PSBL EYE FORMING	PGT#
14	121539	27.3N 123.7E	PCN 3	T3.0/3.0	DNSP17	INIT JHS	RPMK
15	122140	27.0N 123.2E	PCN 3	T3.0/3.0 /00.5/24HRS	DNSP17		PGT#
16	122338	27.4N 123.1E	PCN 3	T3.0/3.0 /00.5/24HRS	DNSP16		RDN
17	130214	27.5N 123.1E	PCN 4		DNSP17		PGT#
18	131020	28.2N 123.9E	PCN 4		DNSP17		PGT#
19	131021	28.3N 124.3E	PCN 4		DNSP17		RHSO
20	131220	28.5N 124.2E	PCN 5		DNSP16		RDN
21	131655	28.7N 124.3E	PCN 3		DNSP17		PGT#
22	132120	29.4N 124.2E	PCN 6		DNSP17		RPMK
23	132120	29.4N 124.0E	PCN 4	T3.0/3.0/-50.0/24HRS	DNSP17		RPMK
24	132220	29.4N 124.0E	PCN 3	T3.5/3.5/-10.5/24HRS	DNSP16		PGT#
25	141001	31.4N 125.0E	PCN 4		DNSP16		PGT#
26	141001	31.4N 125.0E	PCN 4		DNSP17		RHSO
27	141001	31.4N 125.0E	PCN 6		DNSP17		RDN
28	141202	31.7N 126.2E	PCN 2		DNSP16		RHSO
29	141202	31.7N 126.0E	PCN 1		DNSP16		PGT#
30	141438	32.0N 126.5E	PCN 4		DNSP15		RHSO
31	141438	31.9N 126.5E	PCN 3		DNSP15		PGT#
32	142101	32.5N 128.0E	PCN 1		DNSP17		PGT#
33	142101	32.4N 128.0E	PCN 2		DNSP17		RDN
34	142303	32.9N 128.0E	PCN 1		DNSP16		PGT#
35	150139	33.2N 129.2E	PCN 3	T3.0/3.5/-W0.5/24HRS	DNSP15	CL WDRX	PGT#
36	150942	34.5N 132.5E	PCN 6		DNSP17		RHSO
37	151123	34.3N 133.1E	PCN 5		DNSP17		RHSO
38	151125	34.6N 133.1E	PCN 5		DNSP16		PGT#
39	151421	35.2N 134.5E	PCN 6		DNSP15		PGT#
40	151421	35.1N 134.5E	PCN 5		DNSP15		RHSO
41	151421	35.5N 134.0E	PCN 5		DNSP14		RDN

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FLT POSITION	FLT LVL	HGT	DBS	MAX-SFC-WND	MAX-FLT-LVL-4WD	ACCRY	EYE SHAPE	EYE ORIEN-	EYE TEMP (C)	MSN NO.
1	12.727	26.5N 123.1E	700MB	2957	985	30 030	30 150	40 080	6n		+15 +12	1
2	120935	25.7N 123.5E	700MB	2987	988	50 220	10 170	57 090	2n	1 2	CIRCULAR	15
3	131225	28.4N 124.1E	700MB				140	58 010	3n			3
4	140100	30.3N 124.7E	700MB	2904	979	95 110	75 140	70 110	2n			6
5	140333	30.5N 124.1E	700MB	2904	978		130	74 080	2n	5 5	CIRCULAR	30
6	141208	31.4N 124.2E	700MB	2882	976		170	53 050	2n			5
7	141548	32.0N 124.0E	700MB	2875	972		240	80 150	5n	2 3	CIRCULAR	25

RADAR FIXES

FIX NO.	TIME (Z)	FLT POSITION	RADAR	ACCRY	EYE SHAPE	EYE DIM	RADING-CODE	COMMENTS	RADAR POSITION	SIZE
1	111938	24.3N 122.4E	LAND				215/1 //		24.3N 124.2E	67918
2	112000	24.4N 122.4E	LAND				65//1 40217		24.3N 124.2E	67918
3	112100	24.7N 122.4E	LAND				6//1 53514		24.3N 124.2E	67918
4	112100	24.5N 122.7E	LAND				65//4 5///		24.3N 125.3E	67927
5	112200	24.7N 122.8E	LAND				6//1 1 53305		24.3N 124.2E	67918
6	112200	24.7N 122.5E	LAND				65//4 53314		24.3N 125.3E	67927
7	112300	25.0N 122.7E	LAND				6//2 53514		24.3N 124.2E	67918
8	112300	24.4N 122.6E	LAND				6//3 50208		24.3N 125.3E	67927
9	120000	25.1N 122.4E	LAND				65//3 53210		24.3N 124.2E	67918
10	120000	25.1N 122.5E	LAND				6//3 50119		24.3N 125.3E	67927
11	120100	25.3N 122.4E	LAND				6//3 53506		24.3N 124.2E	67918
12	120100	25.2N 122.5E	LAND				6//3 52705		24.3N 125.3E	67927
13	120200	25.3N 122.4E	LAND				6//3 50108		24.3N 124.2E	67918
14	120200	25.2N 122.5E	LAND				6//4 50000		24.3N 125.3E	67927
15	120300	25.2N 122.7E	LAND				6//4 50707		24.3N 125.3E	67927
16	120400	25.3N 122.9E	LAND				6//3 50515		24.3N 124.2E	67918
17	120400	25.5N 122.4E	LAND				6//4 50608		24.3N 125.3E	67927
18	120500	25.3N 122.4E	LAND				6//4 50000		24.3N 125.3E	67927
19	120700	25.4N 123.1E	LAND				45//0 50500		24.3N 125.3E	67927
20	120700	25.6N 123.2E	LAND				45//0 71007		24.3N 124.2E	67918
21	122000	27.0N 123.3E	LAND				5//6 53406		24.3N 125.3E	67927
22	130100	27.4N 123.5E	LAND				6//15 50214		24.3N 125.3E	67927
23	130200	27.5N 123.3E	LAND				6//6 53011		24.3N 125.3E	67927
24	130237	27.4N 123.4E	ACFT	6000	CIRCULAR	25	EYE INHM THICK 54 WRS		24.3N 123.9E	
25	131313	28.4N 124.1E	ACFT	6700			54 WRS		29.3N 125.6E	

26	141900	32,5N 127,3E	LAND		54//0 60410		33,4N 130,3E	67906
27	141900	32,5N 127,3E	LAND		54//0 60605		33,4N 130,3E	67906
28	142100	32,5N 127,4E	LAND		54//1 50716		33,4N 130,3E	67906
29	142200	32,5N 128,3E	LAND		54//1 50719		33,4N 130,3E	67906
30	142300	31,5N 128,5E	LAND		54//1 50319		33,4N 130,3E	67906
31	142300	31,5N 128,5E	LAND	FAIR	40	EYE NOV 0625	SEBURI	
32	150000	31,2N 129,4E	LAND	FAIR	40	20411 50510	SEBURI	33,4N 130,3E
33	150000	31,2N 129,4E	LAND	FAIR	40	EYE NOV 0625	SEBURI	67906
34	150100	31,3N 129,4E	LAND		10411 50311		33,4N 130,3E	67906
35	150100	31,3N 129,4E	LAND	5700	45	EYE NOV 0625	SEBURI	
36	150200	31,5N 129,4E	LAND		10411 50510		33,4N 130,3E	67906
37	150200	31,5N 129,4E	LAND	FAIR	45	EYE NOV 0625	SEBURI	
38	150230	32,5N 129,4E	LAND		20001 4////		36,3N 132,0E	67792
39	150300	33,7N 129,5E	LAND		10411 50622		33,4N 130,3E	67906
40	150300	33,5N 129,7E	LAND		20411 40914		36,3N 132,0E	67792
41	150300	33,5N 129,7E	LAND	5700	40	EYE NOV 0620	SEBURI	
42	150400	33,4N 130,4E	LAND		10451 50522		36,3N 132,0E	67792
43	150400	33,4N 130,7E	LAND		10451 50610		33,4N 130,3E	67906
44	150400	33,4N 129,9E	LAND	5700	20	EYE NOV 0620	WISHIMA	
45	150500	34,0N 130,4E	LAND		20441 50510		36,3N 132,0E	67792
46	150500	34,1N 130,7E	LAND		45//1 50622		35,5N 133,1E	67791
47	150500	34,1N 130,2E	LAND		20441 50625		33,4N 130,3E	67906
48	150500	34,0N 130,2E	LAND	5700	10	EYE NOV 0630	WISHIMA	
49	150500	34,0N 130,4E	LAND	5700	25	EYE NOV 0625	TAKAO	
50	150500	34,2N 130,8E	LAND		45//2 5////		35,0N 133,2E	
51	150500	34,1N 130,8E	LAND		20441 50722		35,5N 133,1E	67791
52	150700	34,3N 130,9E	LAND	5700	20	EYE NOV 0720	TAKAO	33,4N 130,3E
53	150700	34,2N 131,0E	LAND		21071 60810		35,0N 133,2E	67792
54	150700	34,2N 131,1E	LAND		30//1 50810		35,5N 133,1E	67791
55	150800	34,4N 131,4E	LAND		30421 50722		34,3N 132,0E	67792
56	150800	34,3N 131,3E	LAND		21091 50610		33,4N 130,3E	67906
57	150900	34,3N 131,5E	LAND		35//1 50710		35,5N 133,1E	67791
58	150900	34,4N 131,6E	LAND		20411 50814		36,3N 132,0E	67792
59	150900	34,5N 131,9E	LAND	5700	30	EYE NOV 0920	TAKAO	35,0N 133,2E
60	150900	34,4N 131,9E	LAND		35//1 50722		35,5N 133,1E	67791
61	140200	34,4N 131,8E	LAND		21091 60719		33,4N 130,3E	67906
62	151000	34,7N 132,0E	LAND		31041 60622		33,4N 130,3E	67906
63	151000	34,5N 132,2E	LAND		45//1 50710		35,5N 133,1E	67791
64	151000	34,3N 132,1E	LAND		45//1 50922		36,3N 132,0E	67792
65	151100	34,5N 132,7E	LAND		45//1 50710		35,5N 133,1E	67791
66	151100	34,7N 132,4E	LAND		30//0 60519		33,4N 130,3E	67906
67	151100	34,5N 132,6E	LAND		45//1 50722		34,3N 132,0E	67792
68	151200	34,4N 132,0E	LAND		20470 50532		33,4N 130,3E	67906
69	151200	34,4N 132,8E	LAND		45//1 50910		35,5N 133,1E	67791
70	141200	34,7N 133,1E	LAND		45//1 50827		34,3N 132,0E	67792
71	151300	34,7N 133,4E	LAND		45//1 50819		35,5N 133,1E	67791
72	151300	34,4N 133,4E	LAND		45//1 50819		34,3N 132,0E	67792
73	151400	34,5N 133,8E	LAND		45//1 51026		35,5N 133,1E	67791
74	151400	34,5N 133,9E	LAND		45//1 50820		34,3N 132,0E	67792

TYphoon Judy

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACRY	DATUM CODE	SAT	COMMENTS	SITE
1	091005	19.3N 146.3E	PCN 0		DNSP16	APPARENT LOW LVL	PGT#
2	092105	19.3N 146.3E	PCN 0	TU+0/0.0	DNSP16	INIT JDS	PGT#
3	100405	20.3N 146.3E	PCN 4		DNSP16	EXPOSURE LLCC	PGT#
4	102049	22.3N 147.0E	PCN 4	T1+0/1.0 /01+0/24HRS	DNSP16		PGT#
5	110731	21.3N 147.3E	PCN 6		DNSP16	EXPOSURE IN ILL DEFINED LLCC	PGT#
6	112019	22.3N 146.2E	PCN 5	T2+0/2.0 /01+0/24HRS	DNSP17		PGT#
7	121055	23.3N 148.0E	PCN 3		DNSP		PGT#
8	121332	23.3N 147.9E	PCN 3		DNSP17		PGT#
9	121359	23.2N 147.2E	PCN 3		DNSP17		PGT#
10	122155	23.5N 147.0E	PCN 5	T3+5/3.5 /01+5/24HRS	DNSP16		PGT#
11	130333	24.5N 146.7E	PCN 6		DNSP16		PGT#
12	130333	25.5N 146.5E	PCN 6		DNSP17		PGT#
13	131038	26.4N 146.1E	PCN 4		DNSP16		PGT#
14	131038	26.5N 146.3E	PCN 6		DNSP16		RODN
15	131314	26.3N 146.1E	PCN 5		DNSP16		PGT#
16	132120	27.5N 145.4E	PCN 6		DNSP17		PGT#
17	132139	27.4N 145.5E	PCN 5	T4+0/4.0 /01+5/24HRS	DNSP16		PGT#
18	132139	27.5N 146.1E	PCN 6		DNSP16		RODN
19	141001	24.3N 145.0E	PCN 3		DNSP17		PGT#
20	141001	24.5N 145.4E	PCN 6		DNSP17		RKSD
21	141001	24.5N 145.0E	PCN 6		DNSP17		RODN
22	141020	24.4N 145.0E	PCN 3		DNSP16		PGT#
23	141438	24.5N 144.4E	PCN 6		DNSP16		RKSD
24	141438	24.5N 144.4E	PCN 6		DNSP17		PGT#
25	142101	29.3N 144.2E	PCN 1	T9+0/4.0 /50+0/23HRS	DNSP17		PGT#
26	142101	29.5N 144.0E	PCN 2	T3+0/5.0	DNSP17	INIT JDS	RODN
27	142101	29.7N 144.4E	PCN 2	T3+0/5.0	DNSP17	INIT JDS	RPMK
28	142121	29.4N 144.1E	PCN 3		DNSP16		PGT#
29	150139	29.9N 144.1E	PCN 1		DNSP16		PGT#
30	150342	31.0N 144.6E	PCN 2		DNSP17	RAGGED EYE	RODN
31	150342	30.9N 144.6E	PCN 2		DNSP17	CI SAME	PGT#
32	151003	30.9N 144.5E	PCN 2		DNSP16		PGT#
33	151145	31.1N 144.8E	PCN 1		DNSP16		PGT#
34	151421	31.6N 144.8E	PCN 2		DNSP15		PGT#
35	151421	31.6N 145.0E	PCN 2		DNSP15		RODN
36	151421	31.6N 144.7E	PCN 1		DNSP15		RKSD
37	152041	33.0N 145.5E	PCN 2	T3+0/5.0 /50+0/24HRS	DNSP17		RODN
38	152041	32.9N 145.5E	PCN 1	T4+5/4.5+/-00+5/24HRS	DNSP17		PGT#
39	152104	32.9N 145.6E	PCN 1		DNSP16		PGT#
40	152245	31.2N 146.0E	PCN 1		DNSP16		PGT#
41	160121	34.0N 146.1E	PCN 1		DNSP15		PGT#
42	160322	36.0N 148.5E	PCN 2		DNSP17		RODN
43	160322	35.9N 148.5E	PCN 1		DNSP17	CI SAME	PGT#
44	161128	34.6N 149.0E	PCN 1		DNSP16		PGT#
45	161403	37.0N 149.7E	PCN 3		DNSP15		PGT#
46	162022	39.2N 152.5E	PCN 5		DNSP17		RKSD
47	162022	39.1N 152.3E	PCN 3	T3+0/4.0 /W1+5/24HRS	DNSP17		PGT#
48	170103	40.5N 154.1E	PCN 5	T3+5/3.5	DNSP17	INIT JDS	KGWC
49	170302	43.0N 158.9E	PCN 6		DNSP		KGWC
50	171345	44.1N 140.8E	PCN 6		DNSP		KGWC

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	MIN HGT	MOS	MAX-SFC-WND VEL/4RG/RNG	MAX-FLT-LVL<4RD	ACRY	EYE SHAPE	EYE ORIEN-	EYE TEMP (C)	MSN NO.	
			LVL	HGT	MSLP	VEL/4RG/RNG	WT/H/VEL/BLD/INC NAV/MET		DIAH/TATION	UNITY IN DP/SST			
1	130000	24.5N 146.4E	700MB	70115	991	90 070	75	150 56 080 74	4 2		+14 +1n	1	
2	130340	26.0N 146.4E	700MB	3007	990	40 270	50	360 30 270 60	4 10		+13 +13 + 0	1	
3	131410	24.9N 145.8E	700MB	2936				140 51 100 51			+18 +1n	2	
4	131552	26.9N 145.8E	700MB	3917	980			110 55 360 39	5 5	CIRCULAR	35	+11 +14 +11	2
5	140330	27.9N 145.7E	700MB	2917	979	55 270	30	350 45 270 35	2 3		+12 +16 +12	3	
6	140525	24.1N 145.1E	700MB	2899	977	40 140	90	210 50 140 30			+16 +12	3	
7	141335	28.9N 144.5E	700MB	2888	977			160 80 060 25			+15 +11	4	
8	141618	29.1N 144.4E	700MB	2867	972			700 50 250 25			+14 +17 +12	4	
9	150030	29.3N 144.1E	700MB	2774	964	30 010	15	070 78 010 21			+15 +11	5	
10	150317	30.2N 144.2E	700MB	2754	962	70 250	20	330 72 250 20	5 5	ELLIPICAL	35 30 20 090	+14 +14 +1n	5
11	151330	31.5N 144.7E	700MB	2713	957			270 105 210 20			+17 +14	5	
12	151540	31.9N 144.4E	700MB	2680	953			270 120 180 16	2 3	CIRCULAR	25	+16 +19 +13	5
13	160032	33.3N 146.1E	700MB	2655	950	30 250	15	090 92 060 16			+19 +13	7	
14	160318	34.5N 146.7E	700MB	2661	950	30 260	10	360 106 270 17	4 2	CIRCULAR	38	+13 +18 +15	7

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TROPICAL STORM KIT

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACRY	DVORAK CODE	SAT	COMMENTS	SITE	
*	1	192319	13.6N 133.0E	PCN 5	T0+0/0+0	DNSP36	INIT OBS	PGTM
*	2	200946	16.3N 129.2E	PCN 6		DNSP37		PGTM
*	3	202227	13.7N 127.2E	PCN 5	T1+0/1.0 /01+0/23HRS	DNSP37		PGTM
*	4	202227	13.2N 128.0E	PCN 5	T1+5/1.5	DNSP37	INIT OBS	RPMK
*	5	210315	13.6N 128.0E	PCN 5		DNSP35		RPMK
*	6	211048	12.4N 125.4E	PCN 5		DNSP37		RDN
*	7	211108	13.4N 126.5E	PCN 5		DNSP37		RPMK
*	8	211142	13.5N 127.2E	PCN 6		DNSP36		PGTM
*	9	211415	13.0N 128.5E	PCN 6		DNSP35		RDN
*	10	211556	14.0N 125.7E	PCN 5		DNSP35	BASED ON CB W EDGE OUTFLOW	RDN
*	11	212208	13.7N 123.4E	PCN 5	T2+0/2.0 /00+5/24HRS	DNSP37		RPMK
*	12	212208	14.9N 123.2E	PCN 5	T1+5/1.5-/00+5/24HRS	DNSP37		PGTM
13	220257	14.0N 120.7E	PCN 5		DNSP35	2ND LS, 15.0N 120.7E 15.0N 122.7E	RPMK	
14	220257	15.0N 123.3E	PCN 5		DNSP35		PGTM	
15	221048	15.2N 120.8E	PCN 5		DNSP37		RPMK	
16	221048	15.5N 121.0E	PCN 5		DNSP37		PGTM	
17	221539	16.4N 118.1E	PCN 5		DNSP35		RPMK	
18	221539	16.4N 118.0E	PCN 5		DNSP35		PGTM	
19	222148	17.4N 117.8E	PCN 5		DNSP37	CI UP	PGTM	
20	222148	18.1N 117.7E	PCN 5		DNSP37		RPMK	
21	222330	15.5N 115.7E	PCN 5		DNSP37		RPMK	
22	230237	15.5N 115.8E	PCN 5	T2+0/2+0 /00+5/28HRS	DNSP35	APPARENT LOW LVL CIRCULATION	PGTM	
23	230237	15.5N 115.4E	PCN 5	T2+0/2+0 /00+5/28HRS	DNSP35		RPMK	
24	231621	15.5N 115.0E	PCN 5		DNSP35		RPMK	
25	231621	16.4N 114.0E	PCN 6		DNSP37		RPMK	
26	231029	15.7N 115.4E	PCN 6		DNSP37		PGTM	
27	231210	15.0N 112.7E	PCN 6		DNSP37		RPMK	
28	231249	14.5N 114.3E	PCN 6		DNSP36		RDN	
29	232310	15.7N 113.4E	PCN 5	T2+5/2.5 /00+3/21HRS	DNSP37		RPMK	
30	232350	16.3N 112.8E	PCN 6	T2+5/2.5-/00+5/21HRS	DNSP36	2ND LS, 17.6N 123.7E 17.9N 112.9E	PGTM	
31	232350	16.3N 113.0E	PCN 6	T3+0/3.0	DNSP36	INIT OBS	RDN	
32	240043	16.0N 113.3E	PCN 5		DNSP35	BETTER ORGANIZED	RPMK	
33	241151	16.9N 112.7E	PCN 5		DNSP37	CI DOWN	RPMK	
34	241151	17.1N 112.4E	PCN 6		DNSP37		RDN	
35	241645	17.6N 111.7E	PCN 5		DNSP35		RPMK	
36	242251	17.9N 111.2E	PCN 3	T3+0/3.0-/00+5/24HRS	DNSP37		RDN	
37	242251	17.9N 111.2E	PCN 6		DNSP37	SECONDARY AT 16.8N 110.1E	RDN	
38	242332	18.2N 111.0E	PCN 6		DNSP36		PGTM	
39	250343	17.9N 110.4E	PCN 5		DNSP35		RPMK	
40	250343	18.5N 109.5E	PCN 5		DNSP35		RDN	
41	251132	18.9N 109.0E	PCN 5		DNSP37		RPMK	
42	251132	17.8N 108.7E	PCN 6		DNSP37	CI UP	RDN	
43	251215	18.3N 109.1E	PCN 5		DNSP36		PGTM	
44	251527	18.9N 108.3E	PCN 5		DNSP35		RPMK	
45	252231	18.2N 107.6E	PCN 5	T2+0/2+5-/00+5/23HRS	DNSP37		PGTM	
46	260058	17.9N 107.2E	PCN 1	T3+5/3+5-/00+5/26HRS	DNSP36	RAGGED EYE	RPMK	
47	260327	17.9N 107.0E	PCN 3		DNSP35		RPMK	
48	261112	17.5N 106.4E	PCN 5		DNSP37		RPMK	
49	261112	17.6N 105.3E	PCN 5		DNSP37		RDN	
50	261509	17.7N 104.4E	PCN 6		DNSP35		RDN	

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FLT POSITION	FLT LVL	MIV HGT	MISL P	MAX-SFC-WND VEL/BRG/RNG	MAX-FLT-LVL-WND DTR/VEL/BRG/RNG	ACRY NAV/MET	EYE SHAPE	EYE DIREC-TION	EYE TEMP (C) DIAM/IN/DP/SST	MSN NO.
1	210122	13.5N 128.8E	1500FT	1001	15 040	50	190 18 070	20	5 20	ELLIPTICAL	360 +25 +23 +23 27	1
2	210152	13.2N 128.0E	1500FT				070 12 310 120				+10 +9	1
3	212258	14.7N 125.2E	1500FT		995	20 090	245 140 26 100 260	5 2			+25 +25 +23 27	2
4	220251	14.9N 124.2E	1500FT			995	25 100 145 140 23 170 145	4 6			+25 +24 +23 28	2
5	221542	15.4N 121.9E	700MB	3099	1001		040 20 350 10	2 5	CIRCULAR	15	+10 +10 +10	3
6	230200	15.3N 115.7E	700MB	3054		25 080	210 150 33 080 210				+11 +9	4
7	230337	14.6N 115.2E	700MB	3049	996	10 120 180 210 25 120 100	4 5				+10 +10 +9	4
8	230958	14.9N 115.0E	700MB	3031	994	40 090	20 140 37 090 25 3 4				+13 +15 +7	5
9	231659	15.3N 115.3E	700MB	3019	992		350 19 270 15 10 3				+12 +15 +12	5
10	232137	15.6N 114.2E	700MB	3044	995		210 53 110 55 5 4	ELLIPICAL 20 15 150			+10 +13 +10	6
11	232137	15.6N 114.2E	700MB	3044		35 050	45 210 53 110 50				+13 +10	6
12	240040	16.0N 113.7E	700MB									

TYphoon LOLA

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	UVDRK CONE	SAT	COMMENTS	SITE
1	202046	9.1N 146.8E	PCN 5	TU+0/0.0	DNSP17	INIT JJS	PGTM
2	210255	10.2N 146.1E	PCN 6	DNSP17	BASED JN POSS 1LCC	PGTM	
3	211415	9.4N 146.1E	PCN 6	DNSP15	PGTM		
4	212243	11.3N 142.4E	PCN 6	TU+0/0.0 /50.0/26HRS	DNSP16	PGTM	
5	221357	9.4N 141.4E	PCN 5	DNSP15	PGTM		
6	231107	11.0N 139.3E	PCN 5	DNSP16	PGTM		
7	232258	12.7N 137.6E	PCN 5	T1+0/1.0	DNSP17	INIT JJS SECONDARY 11.4N 136.5E	PGT#
8	240222	12.1N 135.3E	PCN 5	DNSP15	PGT#		
9	241010	12.2N 134.2E	PCN 6	DNSP17	CL UP	PGT#	
10	241010	12.6N 134.6E	PCN 5	DNSP17	RPMK		
11	241050	12.6N 134.4E	PCN 5	DNSP16	PGT#		
12	241503	12.5N 133.1E	PCN 5	DNSP15	PGT#		
13	241503	12.5N 134.1E	PCN 5	DNSP15	RPMK		
14	242109	11.7N 131.7E	PCN 5	T2.5/2.5 /01.5/23HRS	DNSP17	PGT#	
15	242332	11.1N 131.7E	PCN 5	DNSP16	BASED JN CH HANUS	PGT#	
16	250204	11.0N 130.5E	PCN 5	DNSP15	PGTM		
17	250204	12.4N 130.8E	PCN 3	T2+0/2.0	DNSP15	RPMK	
18	250350	12.0N 129.6E	PCN 5	DNSP17	INIT JJS	PGT#	
19	250350	11.7N 129.5E	PCN 6	DNSP17	CL UP	RPMK	
20	251215	12.1N 129.9E	PCN 5	DNSP16	MULII CB LINES	PGT#	
21	251215	11.9N 129.8E	PCN 5	DNSP16	RPMK		
22	251446	12.2N 129.0E	PCN 5	DNSP15	PGT#		
23	252231	12.2N 126.9E	PCN 5	T2.5/2.5+/50.0/25HRS	DNSP17	PGT#	
24	252231	12.7N 125.9E	PCN 5	T2.5/2.5 /00.5/20HRS	DNSP17	RPMK	
25	252315	12.3N 125.6E	PCN 5	DNSP16	PGT#		
26	260327	12.9N 125.9E	PCN 5	DNSP15	RPMK		
27	261112	13.0N 124.7E	PCN 5	DNSP17	RPMK		
28	261112	12.1N 124.7E	PCN 5	DNSP17	RDN#		
29	261557	12.9N 124.5E	PCN 5	DNSP16	PGT#		
30	261428	13.0N 124.5E	PCN 6	DNSP15	RPMK		
31	261428	13.3N 124.0E	PCN 5	DNSP15	PGT#		
32	262211	11.5N 122.1E	PCN 3	T3.0/3.0	DNSP17	RKSO	
33	262212	13.3N 122.4E	PCN 3	T3.5/3.5 /01.0/24HRS	DNSP17	RPMK	
34	262212	13.4N 122.5E	PCN 5	T3.5/3.5 /01.0/24HRS	DNSP17	PGTM	
35	262258	13.4N 122.4E	PCN 5	DNSP16	PGT#		
36	270310	13.8N 121.7E	PCN 3	T4+0/4.0+/01.0/24HRS	DNSP15	RPMK	
37	270310	13.7N 121.7E	PCN 5	DNSP15	PGT#		
38	270310	13.4N 121.7E	PCN 5	T2+0/2.0	DNSP15	RDN#	
39	271053	14.3N 120.2E	PCN 3	DNSP17	INIT JJS	PGT#	
40	271053	14.1N 120.4E	PCN 3	DNSP17	RPMK		
41	271100	14.6N 119.9E	PCN 4	DNSP16	PGT#		
42	271140	14.5N 120.2E	PCN 5	DNSP16	RPMK		
43	271551	14.9N 119.2E	PCN 5	DNSP15	RPMK		
44	272152	14.5N 117.4E	PCN 5	DNSP17	PGT#		
45	272152	15.0N 118.9E	PCN 6	DNSP17	RPMK		
46	272152	14.5N 118.8E	PCN 5	DNSP16	RDN#		
47	280222	14.1N 120.2E	PCN 6	DNSP16	RPMK		
48	280252	15.4N 117.1E	PCN 4	T3.5/3.5+/50.0/29HRS	DNSP15	RPMK	
49	280252	15.5N 117.3E	PCN 3	T3.5/3.5 /50.0/29HRS	DNSP15	PGTM	
50	241033	15.7N 116.6E	PCN 3	DNSP17	INVISITINCT EYE	PGT#	
51	241033	15.5N 116.5E	PCN 3	DNSP17	RDN#		
52	281304	16.2N 116.8E	PCN 5	DNSP16	RPMK		
53	281534	16.2N 116.0E	PCN 3	DNSP15	PGT#		
54	282314	16.7N 116.5E	PCN 1	T4+5/4.5 /01.0/20HRS	DNSP17	RPMK	
55	290004	16.7N 114.9E	PCN 1	DNSP15	RPMK		
56	290004	16.5N 114.7E	PCN 1	T4+5/4.5	DNSP15	RDN#	
57	291234	16.3N 114.6E	PCN 3	DNSP15	PGT#		
58	291415	16.5N 114.6E	PCN 1	DNSP15	RPMK		
59	291246	17.0N 113.5E	PCN 1	DNSP16	RPMK		
60	291516	17.1N 113.1E	PCN 1	DNSP15	PGT#		
61	291516	16.9N 113.0E	PCN 1	DNSP15	RDN#		
62	292255	17.1N 113.2E	PCN 1	T3.5/5.5 /01.0/24HRS	DNSP17	RPMK	
63	292255	17.2N 113.0E	PCN 1	T3+0/5.0 /00.5/22HRS	DNSP17	RDN#	
64	292347	17.1N 113.1E	PCN 1	T4+5/4.5	DNSP17	PGT#	
65	300358	17.5N 112.7E	PCN 1	DNSP17	RPMK		
66	301135	18.1N 112.4E	PCN 1	DNSP17	RPMK		
67	301136	18.0N 112.4E	PCN 4	DNSP17	RDN#		
68	301540	18.6N 112.2E	PCN 1	DNSP15	RPMK		
69	302235	14.7N 111.7E	PCN 1	T4+5/4.5	DNSP17	RKSO	
70	302235	14.9N 111.7E	PCN 3	T4+0/5.0-/W1.0/24HRS	DNSP17	RDN#	
71	302329	18.5N 112.0E	PCN 3	DNSP16	EDGE JP DATA	PGT#	
72	010110	18.7N 112.0E	PCN 1	T5+5/5.5-/50.0/26HRS	DNSP16	RPMK	
73	010340	19.1N 111.4E	PCN 1	DNSP15	RKSO		
74	010340	19.0N 111.3E	PCN 6	DNSP15	RDN#		
75	011116	19.4N 110.5E	PCN 5	DNSP17	RPMK		
76	011116	19.6N 110.5E	PCN 1	DNSP17	EXTREME FUGE OF DATA	PGT#	
77	011212	19.5N 110.7E	PCN 1	DNSP16	RDN#		
78	011622	19.8N 110.6E	PCN 6	DNSP15	RPMK		
79	011622	20.0N 110.3E	PCN 1	DNSP15	PGT#		
80	012215	20.0N 110.0E	PCN 2	DNSP17	RKSO		
81	012216	20.1N 109.9E	PCN 1	DNSP17	RDN#		
82	020322	20.7N 109.6E	PCN 1	DNSP15	RPMK		
83	020322	20.6N 109.5E	PCN 1	T5+0/5.0-/W0.5/22HRS	DNSP15	RKSO	
84	021057	21.5N 108.6E	PCN 1	DNSP17	PGT#		
85	021057	21.4N 108.5E	PCN 1	DNSP17	RPMK		
86	021336	21.2N 104.0E	PCN 2	DNSP16	PGT#		
87	021504	21.3N 107.7E	PCN 1	DNSP15	RKSO		
88	021504	21.5N 107.6E	PCN 1	DNSP15	RPMK		
89	022338	21.4N 106.9E	PCN 1	T3.0/4.0-/W2.0/20HRS	DNSP17	RPMK	
90	030034	21.6N 106.4E	PCN 6	T1+0/1.0	DNSP16	EYE ALMOST GONE	RDN#
					DNSP17	INIT JJS	

AIRCRAFT FIRES

FIX NO.	TIME (Z)	FTX POSITION	FLT LVL	MIV HGT	DBS MSLP	MAX-SFC-HD	MAX-FLT-LVL-4HD	ACCRY	EYE SHAPE	EYE ORIEN- DIAM/TATIION	EYE TEMP. (C) OUT/ IN/ DP/ GST	HSD NO.	
					VEL/ARG/RNG	DTH/VEL/DNG/ING	NAV/MET						
1	242200	12.1N 131.3E	700MB	3104	1005	25 340	50 050	30 340	60 5 10		+12 +12 + R	1	
2	250135	12.2N 130.5E	700MB	3105		25 340	50 040	37 340	60		+11 +11	1	
3	250315	12.2N 130.3E	700MB	3097	1002	10 130	35 210	20 130	15 3 5		+11 +13 + 9	1	
4	251351	12.4N 128.1E	700MB	3070			130	50 060	160	5 10		+12 + 7	2
5	251950	12.4N 127.7E	700MB	3065			320	33 230	60			+12 + 7	2
6	252110	12.4N 127.3E	700MB	3044		35 290	30 070	38 290	120	5 10		+12 + R	2
7	260200	12.2N 124.4E	700MB	3041		30 120	30 210	40 130	60			+12 +11	3
8	260350	12.3N 124.2E	700MB	3013	992	45 100	90 180	45 090	40 2 3		+10 +13 +10	3	
9	271100	14.2N 120.4E	700MB	2965			080	72 310	60			+14 +12	4
10	271510	14.4N 119.5E	700MB	2964	985		300	62 190	10	5 5		+13 +15 +11	4
11	280305	15.2N 117.7E	700MB			50 0							5
12	280415	15.2N 117.4E	700MB	2935	983	50 120	40 190	57 120	60 3 2		+12 +15 + 9	5	
13	281955	15.3N 115.7E	700MB	2825	969		130	74 020	45	10 5	ELLIPICAL 50 20 360	+14 +15 +12	6
14	282120	15.4N 115.1E	700MB	2815	969		140	62 160	50	7 5	ELLIPICAL 50 20 360	+14 +15 +11	6
15	290351	16.5N 114.6E	700MB	2812	968	65 090	30 170	76 090	30 3 4	CIRCULAR 50	+12 +15 + 9	7	
16	290532	16.5N 114.3E	700MB	2773		70 350	50 080	82 350	60 5 4		+16 + 9	7	
17	290848	17.0N 114.0E	700MB	2764	963		180	87 090	30 15 3	ELLIPICAL 50 40 340	+12 +17 + R	7	

RAJAN FIRES

FIX NO.	TIME (Z)	FTX POSITION	MADAR	ACCRY	EYE SHAPE	EYF	MADAR-CODE	ASWAK TUFF	COMMENTS	MADAR POSITION	SITF WHD NO.
1	261300	13.4N 123.4E	LAND						PROBABLE EYE NOT WELL DEFINED	14.1N 123.0E	98440
2	262330	13.4N 122.5E	LAND						PSBL CENTER	15.2N 120.6E	98327
3	270055	13.5N 122.4E	LAND						14.1N 123.0E	98440	
4	270130	13.5N 122.4E	LAND	POUR					PSBL CFNTIER	15.2N 120.6E	98327
5	270210	13.5N 122.2E	LAND	POUR					PSBL CENTER	15.2N 120.6E	98327
6	270230	13.5N 122.1E	LAND	POUR					PSBL CENTER	15.2N 120.6E	98327
7	270310	13.5N 122.0E	LAND	POUR					PSBL CENTER	15.2N 120.6E	98327
8	270330	13.4N 121.9E	LAND	POUR					PSBL CENTER	15.2N 120.6E	98327
9	270430	13.4N 121.7E	LAND	POUR					PSBL CENTER	15.2N 120.6E	98327
10	270510	13.4N 121.6E	LAND	POUR					PSBL CENTER	15.2N 120.6E	98327
11	270535	13.4N 121.6E	LAND	POUR					PSBL CFNTIER	15.2N 120.6E	98327
12	270630	14.1N 121.3E	LAND	POUR					PSBL CFNTIER	15.2N 120.6E	98327
13	270710	14.0N 121.1E	LAND						EYE NEG WALL CLD	15.2N 120.6E	98327
14	270730	14.0N 121.0E	LAND	FAIR	CIRCULAR	72			EYE NEG WALL CLD	15.2N 120.6E	98327
15	270810	14.0N 121.1E	LAND	FAIR	CIRCULAR	74			EYE APPNT WALL CLD FRMG E QUAD	15.2N 120.6E	98327
16	270830	14.0N 121.1E	LAND	FAIR	CIRCULAR	79			EYE NEG WALL CLD	15.2N 120.6E	98327
17	270910	13.9N 121.1E	LAND	FAIR	CIRCULAR	73			EYE NEG WALL CLD	15.2N 120.6E	98327
18	271010	14.0N 120.8E	LAND	FAIR	CIRCULAR	79			EYE NEG WALL CLD	15.2N 120.6E	98327
19	271030	13.9N 120.7E	LAND	FAIR	CIRCULAR	70			EYE NEG WALL CLD	15.2N 120.6E	98327
20	271100	14.7N 119.8E	LAND						1020// ////	16.3N 120.6E	98321
21	271210	14.3N 120.3E	LAND	POUR	CIRCULAR	12			EYE APPEARS TU BE REORGANIZING	15.2N 120.6E	98327
22	271230	14.3N 120.4E	LAND	POUR	CIRCULAR	16			EYE APPEARS TU BE REORGANIZING	15.2N 120.6E	98327
23	271310	14.3N 120.3E	LAND	POUR	CIRCULAR	18			EYE BCGNG INDISTINCT DUE TO MTNS	15.2N 120.6E	98327
24	271410	14.3N 120.1E	LAND	POUR	CIRCULAR	16			PSBL EYE NEG WALL CLD	15.2N 120.6E	98327
25	271500	15.0N 119.5E	LAND							16.3N 120.6E	98321
26	271500	14.4N 119.7E	LAND						45// // ////	16.3N 120.6E	98321
27	272100	15.0N 118.8E	LAND						4// // // ////	16.3N 120.6E	98321
28	272300	15.0N 118.3E	LAND						45// // 62712	16.3N 120.6E	98321
29	280300	15.3N 117.4E	LAND						45// // 52709	16.3N 120.6E	98321

TYphoon Name

SATellite FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	UVDRAK CODE	SAT	COMMENTS	SITE
1	282223	19.4N 154.0E	PCN 5	T0+0/0+0	DMSR16	INIT OBS	PGTIV
2	290925	19.7N 153.3E	PCN 6		DMSR16	CI UP	PGTIV
3	291105	20.0N 153.3E	PCN 5		DMSR16	CI UP	PGTIV
4	292205	19.6N 153.2E	PCN 5	T1.5+1.5 /D1.5/24HRS	DMSR16		PGTIV
5	300035	19.4N 152.4E	PCN 5		DMSR15		PGTIV
6	300813	19.4N 153.2E	PCN 6		DMSR17		PGTIV
7	301048	19.4N 152.4E	PCN 5		DMSR16		PGTIV
8	301316	20.1N 153.0E	PCN 5		DMSR15		PGTIV
9	302053	21.5N 153.3E	PCN 6		DMSR17		PGTIV
10	302055	21.5N 153.3E	PCN 6		DMSR17	BASED ON CENTFR CDO	R004
11	302148	21.5N 153.3E	PCN 6	T2.5+2.5 /D1.0/23HRS	DMSR16		PGTIV
12	010015	21.4N 152.3E	PCN 4		DMSR15	BASED IN EXTRAP CU/TCU LINES	PGTIV
13	010435	21.2N 152.0E	PCN 5		DMSR17	CI UP	PGTIV
14	011030	21.5N 151.4E	PCN 5		DMSR15		PGTIV
15	011259	21.4N 151.4E	PCN 5		DMSR15		PGTIV
16	012033	24.0N 150.3E	PCN 4	T3.5+3.5 /D1.0/26HRS	DMSR17		PGTIV
17	012034	24.0N 150.4E	PCN 6	T1+0/1.0	DMSR17	INIT OBS	R004
18	012130	24.1N 150.7E	PCN 4		DMSR16		PGTIV
19	020140	25.2N 149.4E	PCN 5		DMSR15		PGTIV
20	020315	26.3N 150.1E	PCN 5		DMSR17	CI SAME	PGTIV
21	020315	26.3N 150.4E	PCN 6		DMSR17		R004
22	021013	26.4N 150.2E	PCN 5		DMSR16		PGTIV
23	021922	27.4N 150.4E	PCN 5		DMSR15		PGTIV
24	022010	28.1N 150.4E	PCN 4	T3+0/3+0+/D2.0/24HRS	DMSR17		R004
25	022015	28.2N 150.4E	PCN 4	T3+0/3+5 /W0+0/24HRS	DMSR17		PGTIV
26	022113	28.2N 150.6E	PCN 5		DMSR16		PGTIV
27	030122	29.5N 151.1E	PCN 6		DMSR15		PGTIV
28	030856	31.2N 152.7E	PCN 5		DMSR17	CI UP/N	PGTIV
29	030856	31.5N 152.4E	PCN 6		DMSR16		PGTIV
30	031405	32.4N 153.4E	PCN 5		DMSR15		PGTIV
31	031955	35.0N 155.4E	PCN 3	T2+0/3+0 /W1+0/26HRS	DMSR17		KWIC
32	031955	36.0N 155.4E	PCN 4	T2.5+2.5	DMSR17	INIT OBS	KWIC
33	032056	35.6N 156.4E	PCN 3		DMSR16		PGTIV
34	040105	36.4N 156.2E	PCN 3		DMSR15		PGTIV
35	040936	39.4N 161.4E	PCN 4		DMSR15	NO CONVECTION	KWIC
36	041306	41.5N 166.3E	PCN 6		DMSR15	CONVECTION NORTH OF STORM	KWIC
37	041935	42.1N 166.5E	PCN 5		DMSR17	WELL DEFINED SC BANDING	KWIC
38	042305	42.2N 170.5E	PCN 4		DMSR15	WELL DEFINED SC BANDING	KWIC

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	MIV HGT	DRS HSLP	MAX-SFC-WND VEL/ARG/HVG	MAX-FLT-LVL=4WD DTH/VEL/BHG/4NG	ACCRY	EYE SHAPE	EYE ORIEN-	EYE TEMP (C)	HSW	
												NO.	
1	300213	19.3N 152.5E	1500FT	996	30 150	60 260	27 160	35 3 1		+23 +25 +25	23	1	
2	300358	19.3N 152.5E	700MB	1055	996	35 150	60 270	22 150	20 4 2	+10 +13 +10		1	
3	010156	21.6N 152.5E	700MB	1030		35 050	10 190	63 050	30	+15 +7		2	
4	010350	22.1N 152.5E	700MB	1001	990	35 260	30 310	30 260	30 4 2	+13 +16 +9		2	
5	011955	23.8N 150.4E	700MB	2967	986		260	38 160	25 5 2	+12 +18 +17		3	
6	020357	25.5N 150.4E	700MB	2983	985	65 060	15 060	54 330	25 1 7	+14 +15 +17		4	
7	021928	28.1N 152.3E	700MB	2858	973		760	50 160	25 6 3	CIRCULAR 10	+13 +15 +15		5
8	030050	29.1N 150.4E	700MB	2797		65 130	65 270	70 130	20	+20 +10		6	
9	010317	22.5N 151.3E	700MB	2774	965	50 060	55 160	65 060	30 3 3	+12 +18 +11		6	
10	031293	32.5N 151.1E	700MB	2811	969		260	87 090	62	+18 +17		7	
11	031405	31.3N 151.5E	700MB	2824	969		170	75 080	120	+15 +17		7	
12	011503	33.6N 154.0E	700MB	2795	963		360	50 310	4 4 4	ELLIPICAL 40 30 150	+13 +17 +17	7	

TROPICAL STORM NINA

SATELLITE FIXES

FIX NO.	TIME (Z)	FTX POSITION	ACCRY	UVTRAK CODE	SAT	COMMENTS	SITE
1	052203	15.5N 120.5E	PCN 5	TU+0/0+0	DMSP24	INIT JHS	PGFM
2	061045	15.5N 121.3E	PCN 5		DMSP24		PGFM
3	061327	15.5N 121.2E	PCN 5	T1.5/1.5 /01.5/24HRS	DMSP24		PGFM
4	071209	15.5N 121.1E	PCN 5		DMSP24		PGFM
5	071435	15.5N 120.0E	PCN 5		DMSP24		PGFM
6	072200	15.5N 120.3E	PCN 5	T2.5/2.5 /01.0/23HRS	DMSP24		PGFM
7	072310	15.5N 120.2E	PCN 5		DMSP24		PGFM
8	081041	15.5N 120.4E	PCN 5		DMSP24	C1 UP	PGFM
9	081441	15.5N 120.4E	PCN 5		DMSP24		RPMK
10	081155	15.5N 120.2E	PCN 5		DMSP24		PGFM
11	081558	15.5N 120.1E	PCN 5		DMSP24		RDN
12	082141	15.5N 120.4E	PCN 5		DMSP24		PGFM
13	082222	15.5N 120.3E	PCN 5		DMSP24		PGFM
14	090259	15.5N 121.5E	PCN 5	T2.5/2.5 /0	DMSP25	INIT JHS	RPMK
15	090259	15.5N 120.3E	PCN 5	T3.0/3.0 /00.5/24HRS	DMSP25		PGFM
16	091022	15.5N 120.4E	PCN 5		DMSP25		PGFM
17	091135	15.5N 121.1E	PCN 5		DMSP25		PGFM
18	091501	15.5N 122.0E	PCN 5		DMSP25		RPMK
19	091501	15.5N 122.6E	PCN 5		DMSP25		RPMK
20	092303	15.5N 121.0E	PCN 5	T2.5/2.5 /0 /50.0/20HRS	DMSP25		RDN
21	092303	15.5N 120.4E	PCN 5		DMSP25		RPMK
22	100116	15.5N 120.0E	PCN 5	T2.5/2.5 /00.5/22HRS	DMSP25		RDN
23	100199	15.5N 120.3E	PCN 5	T3.5/3.5 /00.5/22HRS	DMSP25		PGFM
24	101522	15.5N 118.0E	PCN 5		DMSP25		RPMK
25	101523	15.5N 119.0E	PCN 5		DMSP25		PGFM
26	102243	15.5N 117.3E	PCN 5	T3.0/3.0 /00.5/23HRS	DMSP27		RPMK
27	102243	15.5N 117.5E	PCN 5		DMSP27	POSSIBLE 2ND 15.5N 116.3E	RDN
28	102359	15.5N 117.0E	PCN 5	T4.0/4.0 /00.5/24HRS	DMSP27		PGFM
29	102359	15.5N 117.3E	PCN 5		DMSP27		RPMK
30	110223	15.5N 117.6E	PCN 5		DMSP27	PARTIALLY EXPOSED LLCC BASED ON EXPOSED LLCC	PGFM
31	110223	15.5N 116.4E	PCN 5		DMSP27		RPMK
32	110405	15.5N 118.3E	PCN 5		DMSP27		PGFM
33	111125	15.5N 117.9E	PCN 5		DMSP27		RPMK
34	111241	15.5N 117.4E	PCN 5		DMSP27		RPMK
35	111505	15.5N 117.1E	PCN 5		DMSP27	PARTIALLY EXPOSED LLCC	PGFM
36	111505	15.5N 117.5E	PCN 5		DMSP27		RPMK
37	112223	15.5N 116.6E	PCN 5		DMSP27	PARTIALLY EXPOSED LLCC	PGFM
38	112223	15.5N 116.1E	PCN 5	T3.0/3.0 /50.0/24HRS	DMSP27	POSS 2ND EXPOSED 15.5N 117.0E	RPMK
39	112223	15.5N 115.5E	PCN 5		DMSP27		RKSD
40	120347	15.5N 114.7E	PCN 5		DMSP27		RPMK
41	121105	15.5N 115.5E	PCN 5		DMSP27		RDN
42	121105	15.5N 114.3E	PCN 5		DMSP27		RPMK
43	121529	15.5N 116.1E	PCN 5		DMSP27		RPMK
44	122209	15.5N 115.6E	PCN 5		DMSP27		PGFM
45	122326	15.5N 116.0E	HCN 3		DMSP27		PGFM
46	122326	15.5N 116.5E	PCN 5		DMSP27		RPMK
47	130329	15.5N 116.2E	PCN 5	T4.0/4.0 /0	DMSP25	INIT JHS	RDN
48	130329	15.5N 115.5E	PCN 5	T3.0/3.0 /50.0/24HRS	DMSP25	LLCC	RPMK
49	131045	15.5N 115.2E	PCN 5		DMSP27		RPMK
50	131045	15.5N 114.4E	PCN 5		DMSP27	CI DUN	PGFM
51	131207	15.5N 116.4E	PCN 5		DMSP27		PGFM
52	131611	15.5N 115.2E	PCN 5		DMSP27	PARTIALLY EXPOSED LLCC NO BASED ON CENTER OF FEATURES	RPMK
53	132326	15.5N 115.7E	PCN 5	T1.5/2.5 /W1.5/20HRS	DMSP25		RDN
54	140311	15.5N 114.9E	PCN 5	T3.5/4.0 /W0.5/24HRS	DMSP25		PGFM
55	140311	15.5N 115.2E	PCV 3	T2.5/2.5 /0	DMSP25	INIT JHS PARTIALLY EXPOSED LLCC	PGFM
56	140311	15.5N 115.1E	PCN 5		DMSP25		RKSD
57	141207	15.5N 115.3E	PCN 5	T3.0/3.0 /0	DMSP27	EXPOSED LLCC	RPMK
58	141553	15.5N 114.9E	PCN 5		DMSP25		RDN
59	141553	15.5N 114.8E	PCN 5		DMSP25		RPMK
60	142307	15.5N 113.6E	PCN 5		DMSP27	NE OF CON	RKSD
61	142307	15.5N 114.7E	PCN 5		DMSP27		RDN
62	151148	15.5N 111.9E	PCN 5		DMSP27		RPMK
63	151316	15.5N 111.9E	PCN 5		DMSP25		RPMK
64	151535	15.5N 112.2E	PCN 5		DMSP25		RDN
65	151535	15.5N 111.7E	PCN 5		DMSP25		PGFM
66	160016	15.5N 112.1E	PCN 5	T2.0/2.0 /0	DMSP26	INIT JHS	RPMK
67	160417	21.5N 112.0E	PCN 5		DMSP24		RPMK
68	161128	21.5N 113.1E	PCN 5		DMSP27		RDN
69	161128	21.5N 114.2E	PCN 5		DMSP27		RPMK
70	161256	22.5N 112.0E	PCN 5		DMSP24		RDN
71	161517	21.5N 114.4E	PCN 5		DMSP25		RPMK
72	161517	22.5N 114.2E	PCN 5		DMSP25	C1 DUN	PGFM
73	162356	21.5N 114.2E	PCN 5		DMSP26	ZNU 21.5N 110.9E	RDN
74	162359	21.5N 111.3E	PCN 5		DMSP26		RPMK

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FTX POSITION	FLT LVL	HGT	MSLP	MAX-SFC-WND	MAX-FLT-LVL-4WD	MAX-FLT-LVL-4WD	ACCRY	EYE	EYE ORIEN-	EYE TEMP. (°C)	MSN
			LVL			VEL/ARG/RNG	VEL/ARG/RNG	VEL/ARG/RNG	NAV/MET	SHAPE	DIR/T	IN/ JP/SST	NO.
1	072336	15.5N 129.3E	1500FT		993	30 080	55 110	36 050	160	3 2	+25 +25 +21	24	3
2	080230	15.5N 128.7E	1500FT		992	30 060	30 120	33 060	90	4 2	+25 +27 +21	27	3
3	081555	14.5N 126.1E	700MB	2973	986		100 53 010	40	4 4	+16 +16 +11		4	
4	081900	14.5N 125.8E	700MB	2974		090 53 320	120				+13 +13		6
5	082040	14.5N 125.3E	700MB	2964	986	260 39 120	120	4 8			+16 +16 +17		6

5	090346	15.2N 123.4E	700NM	2945	984	65 350 50	080 45 350 50	5 5	+17 +18 +11	5
7	100321	15.2N 119.7E	700NM	3012	984	45 350 100	280 42 120 25	4 10	+10 +10	6
8	100344	14.5N 119.7E	700NM	1009	994	45 200 30	280 52 200 20	3 10	+10 +10	6
9	110255	15.3N 117.8E	700NM	2939	984	45 040 100	150 44 040 125	4 6	+12 +12 +10	7
10	111333	15.4N 117.5E	700NM	2923	981	40 230 55	200 30 100 55	6 5	+13 +09	7
11	111329	15.5N 117.6E	700NM	2991	989	180 40 200 80			+12 +11	9
12	111328	15.4N 117.3E	700NM	2979	987	220 60 190 90	5 2	+13 +13	8	
13	120327	15.5N 116.2E	700NM			67 100 160	190 57 110 60	4 5	+08	9
14	121505	14.5N 115.7E	700NM	2956	985	190 61 070 125	5 4	+11 +15 +09	10	
15	140201	14.1N 113.6E	700NM	2954	984	190 55 100 35	7 2			10
16	150233	14.5N 112.8E	700NM	2970	987	45 090 50	180 50 070 40	7 5		

RAJAH FIXES

FIX NU. (Z)	TIME	FIX POSITION	HARAR	ACCHY	EYE SHAPE	EYF DIAM	RADIUS-CODE ASWAM TDUFF	COMMENTS	MADAR POSITION	SITE WMO NO.
1	081545	14.0N 125.0E	LAND		CIRCULAR			EYE OPEN S MOVG 2707	PARADES	14.2N 122.7E
2	090730	14.2N 122.8E	LAND			25//	////	QNT 40 KTS		16.3N 120.6E 98321
3	090900	14.2N 120.8E	LAND			1261//	5//	QNT 30 KTS		16.3N 120.6E 98321
4	091100	14.2N 122.8E	LAND			1151//	////	EYE ELLIPTICAL OPEN NE		16.3N 120.6E 98321
5	091230	15.3N 122.4E	LAND			1199//	52927	EYE ELLIPTICAL OPEN N 36 KTS		16.3N 120.6E 98321
6	091330	14.4N 122.5E	LAND			103H//	4//	EYE CIRCULAR UPEN NW 42 KTS		16.3N 120.6E 98321
7	091330	14.4N 122.2E	LAND	FAIR	CIRCULAR	11				15.2N 120.6E 98321
8	091400	14.4N 122.5E	LAND			1031//	4//	QNT 40 KTS		16.3N 120.6E 98321
9	091403	14.4N 122.2E	LAND	GOOD	CIRCULAR	4				15.2N 120.6E 98321
10	091430	14.4N 122.1E	LAND	FAIR	CIRCULAR	4		EYE PASSING OVER PULILLO IS		15.2N 120.6E 98321
11	091500	14.4N 122.3E	LAND			1031//	42700	QNT 40 KTS		16.3N 120.6E 98321
12	091510	14.4N 122.0E	LAND	FAIR	CIRCULAR	8		EYE		15.2N 120.6E 98321
13	091530	15.0N 122.1E	LAND			1031//	42710	QNT 40 KTS		16.3N 120.6E 98321
14	091550	15.0N 121.8E	LAND	GOOD	CIRCULAR	10		EYE		15.2N 120.6E 98321
15	091550	15.0N 121.8E	LAND			1130//	52715	QNT 32 KTS		16.3N 120.6E 98321
16	091530	14.9N 121.7E	LAND	FAIR	CIRCULAR	10		EYE		15.2N 120.6E 98321
17	091710	15.0N 121.5E	LAND					NFG WALL CLD MOVED ONSHR		15.2N 120.6E 98321
18	091730	15.0N 121.5E	LAND	FAIR				NFG WALL CLD CNTR DVR LAND		15.2N 120.6E 98321
19	091810	15.0N 121.4E	LAND	POOR				PSBL CNTH NEG WALL CLD DVK MTNS		15.2N 120.6E 98321
20	091830	15.0N 121.3E	LAND	POOR				PSBL CNTH NEG WALL CLD		15.2N 120.6E 98321
21	091910	15.0N 121.2E	LAND	POOR				PSBL CNTH NEG WALL CLD		15.2N 120.6E 98321
22	091930	15.1N 121.1E	LAND	FAIR				CNTR LEAVING MTNS		15.2N 120.6E 98321
23	092000	14.7N 120.7E	LAND	POOR	CIRCULAR	14		PSBL EYE	WALLACE	16.0N 120.3E
24	092010	15.0N 121.0E	LAND	POOR				NFG WALL CLD MVY ATTENUATION		15.2N 120.6E 98321
25	092020	15.0N 120.9E	LAND	POOR				PSBL CNTH NEG WALL CLD ATTEN		15.2N 120.6E 98321
26	092100	15.0N 120.8E	LAND		CIRCULAR	19		PSBL EYE	WALLACE	16.0N 120.3E
27	092110	15.0N 120.7E	LAND	POOR				PSBL CNTH NEG WALL CLD		15.2N 120.6E 98321
28	100025	14.9N 120.5E	LAND	POOR				LOCATED 190/21 FRON CLARK		15.2N 120.6E 98321
29	141150	14.4N 112.3E	LAND							22.3N 114.2E 45005
30	151510	19.2N 112.2E	LAND			45//	/3107			22.3N 114.2E 45005
31	151820	19.4N 112.1E	LAND			45//	/3106			22.3N 114.2E 45005
32	142120	19.4N 112.2E	LAND			67//	/82606			22.3N 114.2E 45005
33	152330	20.3N 112.2E	LAND			67//	/93005			22.3N 114.2E 45005
34	160300	20.9N 112.5E	LAND			67//	/90109			22.3N 114.2E 45005

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TYPHOON ORA

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACRY	UVTRAK CODE	SAT	COMMENTS	SITE
1	072310	11.2N 132.4E	PCV 2	T0+0/0+0	DMSH16	INIT JIS	PGT#
2	081417	11.2N 132.4E	PCV 6	T0+0/1+0	DMSH15	SECONDARY 11.2N 132.4E	PGT#
3	082141	14.5N 130.5E	PCV 6	T1+0/1+0 /01+0/23HRS	DMSH17		PGT#
4	042252	14.5N 130.5E	PCV 6		DMSH16		PGT#
5	090117	14.3N 130.2E	PCV 5		DMSH15		PGT#
6	091022	14.6N 130.7E	PCV 5		DMSH17		PGT#
7	091133	14.6N 130.5E	PCV 5		DMSH16		PGT#
8	091335	14.5N 130.4E	PCV 5		DMSH15		PGT#
9	092121	17.0N 131.3E	PCV 6	T1+0/1+0 /50+0/24HRS	DMSH17		PGT#
10	092256	17.1N 131.2E	PCV 6		DMSH16		PGT#
11	101002	14.7N 132.2E	PCV 5		DMSH17	CL UP PARTIALLY EXPOSED LLCC	PGT#
12	101002	14.6N 131.1E	PCV 5		DMSH16		RPMK
13	101117	14.6N 130.1E	PCV 5		DMSH16		PGT#
14	101323	14.6N 131.1E	PCV 6		DMSH15		PGT#
15	102101	14.6N 130.4E	PCV 6		DMSH17		PGT#
16	102103	14.6N 130.4E	PCV 6		DMSH17		RODN
17	102359	12.3N 129.3E	PCV 6		DMSH16		PGT#
18	110223	20.4N 129.5E	PCV 5	T3+0/1+0	DMSH15	INIT JIS EXPOSED LLCC	RODN
19	110223	20.0N 129.5E	PCV 5	T2+5/2+5	DMSH15	INIT JIS	RPMK
20	110223	11.3N 129.3E	PCV 5	T2+0/2+0 /01+0/27HRS	DMSH15		PGT#
21	110303	21.0N 129.2E	PCV 5	T2+0/2+0 /01+0/27HRS	DMSH17	CL UP	PGT#
22	111291	21.3N 127.3E	PCV 5		DMSH15	CL UP	RPMK
23	111291	20.5N 126.1E	PCV 5		DMSH16		RKSD
24	111305	21.0N 126.3E	PCV 5		DMSH15		PGT#
25	111305	21.3N 126.5E	PCV 5		DMSH15		RPMK
26	112223	21.4N 129.1E	PCV 5	T3+5/3.5+ /01+0/20HRS	DMSH17		RPMK
27	112223	21.4N 126.7E	PCV 6	T3+0/3.0+ /01+0/20HRS	DMSH17		PGT#
28	112223	21.4N 124.4E	PCV 5	T3+0/3.0+	DMSH17	INIT JIS	RKSD
29	121205	22.0N 123.4E	PCV 5		DMSH15	BEGINNING OF HANDLING TYPE EYE	PGT#
30	120205	22.0N 124.1E	PCV 5		DMSH15		RODN
31	121105	22.3N 122.4E	PCV 5	T3+0/3.0+ /50+0/24HRS	DMSH17		RODN
32	121105	22.3N 121.1E	PCV 5		DMSH17		RPMK
33	121147	22.3N 121.1E	PCV 5		DMSH15		RODN
34	121147	22.1N 122.1E	PCV 5		DMSH15		PGT#
35	122205	22.4N 129.7E	PCV 5	T4+0/4+0 /01+0/26HRS	DMSH17		PGT#
36	122205	22.0N 129.4E	PCV 5	T4+0/4.0+ /01+0/26HRS	DMSH17		RKSD
37	126325	21.1N 129.3E	PCV 5	T4+5/4.5+ /01+0/25HRS	DMSH16		RPMK
38	126325	21.1N 129.9E	PCV 5		DMSH16		PGT#
39	130329	21.7N 129.9E	PCV 5		DMSH15		RPMK
40	130329	21.7N 129.4E	PCV 5	T4+0/4.0+ /01+0/25HRS	DMSH15		RODN
41	131045	24.6N 121.3E	PCV 5		DMSH17		PGT#
42	131045	24.7N 121.2E	PCV 5		DMSH17		RKSD
43	131045	24.2N 121.3E	PCV 5		DMSH17		RPMK
44	131207	24.7N 121.2E	PCV 5		DMSH17		PGT#
45	131511	24.5N 121.7E	PCV 5		DMSH17		RODN
46	131511	25.5N 121.5E	PCV 5	T3+0/4.0+ /41+0/23HRS	DMSH17		PGT#
47	141305	25.0N 121.4E	PCV 5		DMSH17	EXPOSED LLCC	PGT#
48	140311	24.5N 121.3E	PCV 5	T3+0/4.0+ /41+0/24HRS	DMSH15		RODN
49	140311	24.5N 121.4E	PCV 5	T3+0/3.0+ /41+0/24HRS	DMSH15	PARTIALLY EXPOSED LLCC	RKSD
50	141025	27.1N 126.7E	PCV 5		DMSH17		RODN
51	141025	27.1N 126.4E	PCV 5		DMSH17	CL UP	PGT#
52	141145	27.2N 126.3E	PCV 5		DMSH17		PGT#
53	141553	27.2N 127.2E	PCV 5		DMSH15		RPMK
54	141553	24.0N 127.4E	PCV 5		DMSH15		RODN
55	141553	27.2N 127.7E	PCV 5		DMSH15		RKSD
56	142125	24.3N 128.4E	PCV 5		DMSH17	PARTIALLY EXPOSED LLCC F EDGE MAJ CONV	PGT#
57	142125	27.4N 129.5E	PCV 5	T2+0/2.5+ /41+0/25HRS	DMSH17		RODN
58	142249	29.0N 129.1E	PCV 5	T2+0/3.0+ /41+0/25HRS	DMSH17		PGT#
59	151006	31.5N 125.3E	PCV 5		DMSH17		PGT#

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FLT POSITION	FLT LVL	MIN HGT	MPS	MAX-SFC-LW40	MAX-FLT-LVL-4ND	MAX-FLT-LVL-4ND	ACRY	EYE	EYE ORIENT-	EYE TEMP (C)	MSN
			LVL	HGT	MPS	VEL/HRG/RNG	DTM/VEL/BRG/RNG	DTM/VEL/BRG/RNG	NAV/MET	SHAPE	DIR/IM/3D/ST	NO.	
1	092256	17.1N 134.0E	700MH	1080	397	50 150	10	200	38 080	20	5 2	+23 +25 +22	1
2	100238	17.6N 131.5E	700MH	1071	398	50 150	10	270	40 210	30	5 2	+9 +13 +7	1
3	101230	17.1N 131.3E	700MH	1071	398							+13 +7	2
4	101555	14.3N 131.0E	700MH	1031	496							+12 +11 +11	2
5	110321	19.5N 129.2E	700MH			50 110	15	110	45 210	45	3 4	+12 +14 +16	3
6	110530	20.3N 129.5E	700MH			30 310	30	080	36 310	120		+13 +11	3
7	110539	20.7N 129.1E	700MH			387		240	33 190	75	4 4	+11 +13 +11	3
8	111325	21.9N 129.4E	700MH	2987	399			050	42 310	90		+15 +12	4
9	111530	21.2N 128.4E	700MH	2945	992			190	55 090	20	5 2	+12 +16 +16	4
10	120303	27.1N 121.9E	700MH	2323	070			130	65 040	5	3 7	+14 +16 +13	5
11	120710	27.6N 123.4E	700MH	2761	492	75 180	15	240	70 150	10	5 5	+14 +16 +12	5
12	130430	21.7N 122.7E	700MH	2600	944	100 060	5	210	80 120	10	2 2	+14 +15 +16	5
13	130555	24.0N 127.2E	700MH	2640	499	100 180	15	240	70 180	20		+15 +12	5
14	131222	25.8N 123.4E	700MH	2980	398			220	62 130	20	2 1	+17 +19 +11	7
15	140040	26.0N 121.1E	700MH	2987	496	40 160	10	240	54 160	10		+18 +19	7
16	140252	26.2N 124.0E	700MH	1024	991	35 180	75	240	48 180	10	2 4	+14 +15 +4	7
17	141315	27.5N 128.4E	700MH	1040	995			240	47 180	90		+14 +13	9
18	141430	27.5N 128.4E	700MH	1034	998			240	45 200	30	2 3	+11 +12 +12	9

RADAR FIXES

FIX NU.	TIME (Z)	FIX POSITION	HEAD	ADCPY	EYF SHAPE	EYE DISH	HADING-CODE ANWAK TOUFF	COMMENTS	MADAR POSITION	SITF W40 NO.
1	112300	21.7N 124.4E	LAND				34//0 /////		26.3N 124.2E	47918
2	120000	21.4N 124.5E	LAND				21613 52916		26.3N 124.2E	47918
3	120100	21.3N 124.3E	LAND				10613 52919		26.3N 124.2E	47918
4	120100	23.0N 124.4E	LAND				2//05 5////		26.3N 125.3E	47927
5	120200	21.3N 124.2E	LAND				10423 62710		26.3N 124.2E	47918
6	120200	23.0N 124.2E	LAND				25//5 52711		26.3N 125.3E	47927
7	120300	23.0N 123.4E	LAND				10413 72809		26.3N 124.2E	47918
8	120300	22.0N 124.1E	LAND				25//3 52911		26.3N 125.3E	47927
9	120400	23.1N 123.4E	LAND				10732 72911		26.3N 124.2E	47918
10	120400	23.1N 123.4E	LAND				206//5 53014		26.3N 125.3E	47927
11	120500	23.1N 123.7E	LAND				20823 73011		26.3N 124.2E	47918
12	120500	23.1N 123.7E	LAND				35//5 52710		26.3N 125.3E	47927
13	120600	23.2N 123.5E	LAND				45//2 72911		26.3N 124.2E	47918
14	120500	23.1N 123.4E	LAND				35//5 52715		26.3N 125.3E	47927
15	120700	23.2N 123.4E	LAND				20822 72709		26.3N 124.2E	47918
16	120700	23.2N 123.3E	LAND				35//4 53303		26.3N 125.3E	47927
17	120700	22.3N 123.3E	LAND	GOOD		26	EVE		26.3N 125.3E	47927
18	120900	23.2N 123.1E	LAND				34//0 52711		26.3N 125.3E	47927
19	120900	23.3N 123.2E	LAND				10444 53329		26.3N 121.6E	46509
20	120900	23.2N 123.2E	LAND				10412 72911		26.3N 124.2E	47918
21	120900	23.2N 123.1E	LAND				21633 72708		26.3N 124.2E	47918
22	120900	23.2N 123.1E	LAND				10584 52907		26.3N 121.6E	46509
23	120900	23.2N 123.1E	LAND				21633 72708		26.3N 125.3E	47927
24	121100	23.2N 122.8E	LAND				35//6 52708		26.3N 124.2E	47918
25	121100	23.1N 122.4E	LAND				11123 52709		26.3N 121.6E	46509
26	121100	23.2N 122.4E	LAND				31462 72906		26.3N 124.2E	47918
27	121200	23.1N 122.7E	LAND				31467 72906		26.3N 124.2E	47918
28	121300	23.1N 122.6E	LAND				12424 52607		26.3N 121.6E	46509
29	121300	22.1N 122.6E	LAND				31547 72708		26.3N 124.2E	47918
30	121400	22.0N 122.5E	LAND				11324 52105		26.3N 121.6E	46509
31	121400	22.0N 122.5E	LAND				31511 72506		26.3N 121.6E	47918
32	121500	21.4N 122.5E	LAND				10314 50000		26.3N 121.6E	46509
33	121500	21.4N 122.5E	LAND				31511 50000		26.3N 124.2E	47918
34	121500	22.1N 122.6E	LAND				12424 52607		26.3N 121.6E	46509
35	121500	21.4N 122.5E	LAND				31511 50000		26.3N 124.2E	47918
36	121700	22.0N 122.7E	LAND				12513 50708		26.3N 121.6E	46509
37	121700	22.0N 122.5E	LAND				31411 50106		26.3N 124.2E	47918
38	121900	23.1N 122.7E	LAND				12624 50308		26.3N 121.6E	46509
39	121900	23.1N 122.7E	LAND				10342 50311		26.3N 124.2E	47918
40	121900	22.3N 122.7E	LAND				20312 53615		26.3N 124.2E	47918
41	122000	22.5N 122.8E	LAND				12322 53609		26.3N 121.6E	46509
42	122000	22.5N 122.8E	LAND				21322 50310		26.3N 124.2E	47918
43	122100	22.7N 122.6E	LAND				35//6 43613		26.3N 125.3E	47927
44	122100	22.5N 122.6E	LAND				21312 73612		26.3N 124.2E	47918
45	122200	22.4N 122.6E	LAND				20476 53013		26.3N 125.3E	47927
46	122200	22.4N 122.6E	LAND				11312 73611		26.3N 124.2E	47918
47	122300	23.0N 122.7E	LAND				20416 50112		26.3N 125.3E	47927
48	122300	23.0N 122.7E	LAND				12293 53513		26.3N 121.6E	46509
49	122300	23.0N 122.7E	LAND				21313 73511		26.3N 124.2E	47918
50	130000	23.1N 122.7E	LAND				10313 73511		26.3N 124.2E	47918
51	130000	23.1N 122.7E	LAND				22416 53505		26.3N 125.3E	47927
52	130100	23.3N 122.7E	LAND				10224 73509		26.3N 124.2E	47918
53	130100	23.3N 122.7E	LAND				11213 53509		26.3N 121.6E	46509
54	130100	23.2N 122.8E	LAND				22326 53306		26.3N 125.3E	47927
55	130200	23.4N 122.7E	LAND				22375 50212		26.3N 125.3E	47927
56	130200	23.3N 122.6E	LAND				12213 53506		26.3N 121.6E	46509
57	130200	23.4N 122.7E	LAND				10214 53508		26.3N 124.2E	47918
58	130300	23.3N 122.7E	LAND				10122 73607		26.3N 124.2E	47918
59	130300	23.5N 122.6E	LAND				11212 53510		26.3N 121.6E	46509
60	130300	23.4N 122.7E	LAND				22295 53404		26.3N 125.3E	47927
61	130300	23.4N 122.7E	LAND	6000		10	EVE NOV 0120		26.3N 125.3E	47927
62	130400	23.6N 122.7E	LAND				10212 50308		26.3N 121.6E	46509
63	130400	23.7N 122.7E	LAND				11212 73608		26.3N 124.2E	47918
64	130400	23.6N 122.7E	LAND				12285 50213		26.3N 125.3E	47927
65	130500	23.9N 122.8E	LAND				12212 50211		26.3N 121.6E	46509
66	130500	23.8N 122.8E	LAND				12335 50110		26.3N 125.3E	47927
67	130500	23.8N 122.7E	LAND				12313 70109		26.3N 124.2E	47918
68	130500	24.0N 122.0E	LAND				11213 53010		26.3N 121.6E	46509
69	130600	23.9N 122.7E	LAND				10212 70209		26.3N 124.2E	47918
70	130500	23.9N 122.9E	LAND				12314 54011		26.3N 125.3E	47927
71	130700	24.0N 122.9E	LAND				12415 53605		26.3N 125.3E	47927
72	130700	24.1N 122.9E	LAND				10213 70209		26.3N 124.2E	47918
73	130900	24.2N 123.0E	LAND				12663 50309		26.3N 121.6E	46509
74	130900	24.1N 123.0E	LAND				20254 50408		26.3N 125.3E	47927
75	130900	24.2N 123.0E	LAND				10213 70309		26.3N 124.2E	47918
76	130900	24.3N 123.1E	LAND				12123 50309		26.3N 121.6E	46509
77	130900	24.3N 123.1E	LAND				10212 70309		26.3N 124.2E	47918
78	130900	24.3N 123.1E	LAND	6000		10	EVE NOV 0115		26.3N 125.3E	47927
79	130900	24.3N 123.1E	LAND				11312 70309		26.3N 124.2E	47918
80	131000	24.5N 123.1E	LAND				10314 53612		26.3N 125.3E	47927
81	131000	24.5N 123.1E	LAND				EVE NOV 3615		26.3N 125.3E	47927
82	131000	24.5N 123.1E	LAND	6000		10	10314 51008		26.3N 125.3E	47927
83	131100	24.5N 123.1E	LAND				11311 70210		26.3N 124.2E	47918
84	131100	24.7N 123.1E	LAND				35//// 50211		26.3N 125.3E	47927
85	131100	24.7N 123.1E	LAND	6000		10	EVE NOV 3620		26.3N 125.3E	47927
86	131200	24.9N 123.1E	LAND				67//1 73611		26.3N 121.6E	46509
87	131200	24.9N 123.1E	LAND				67//1 73611		26.3N 125.3E	47927
88	131200	24.9N 123.1E	LAND				67//1 73611		26.3N 124.2E	47918
89	131200	24.8N 123.1E	LAND	6000		10	EVE NOV 3615		26.3N 125.3E	47927
90	131300	25.0N 123.1E	LAND				67//1 73609		26.3N 124.2E	47918
91	131300	24.9N 123.1E	LAND				67//1 50105		26.3N 125.3E	47927
92	131400	25.1N 123.1E	LAND				7//4 53071		26.3N 125.3E	47927
93	131500	25.3N 123.1E	LAND				67//4 53071		26.3N 125.3E	47927
94	131700	25.4N 123.0E	LAND				35//// 52205		26.3N 121.6E	46509
95	140700	26.7N 124.9E	LAND	6000		45	EVE		26.3N 125.3E	47927
96	140800	26.8N 125.3E	LAND	6000		45	EVE NOV 0740		26.3N 125.3E	47927

TROPICAL DEPRESSION 26

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DATA/RAN CODE	SAT	COMMENTS	SITE
1	042111	19.5N 153.3E	PCV 5	TU+0/0+0	DNSP16	INIT JIS	PGT#
2	091339	21.5N 161.7E	PCV 6	TU+0/0+0 /SD+0/22HRS	DNSP17		PGT#
3	092033	22.5N 152.0E	PCV 6		DNSP16		PGT#
4	100336	22.5N 150.4E	PCV 6		DNSP16	CI SA4C	PGT#
5	100349	22.5N 150.0E	PCV 6	TU+0/1+0 /SD+0/22HRS	DNSP16		PGT#
6	110041	22.5N 150.4E	PCV 6		DNSP16	PSD1 2D EXPOSED LLCC	PGT#
7	110501	22.5N 150.4E	PCV 5		DNSP16	CI SA42	PGT#
8	111018	21.5N 150.1E	PCV 6		DNSP16		PGT#
9	111323	22.5N 150.0E	PCV 6		DNSP16		PGT#
10	111442	21.5N 151.4E	PCV 6		DNSP17	PSD BY EXPOSED LLCC NO QJAD	PGT#
11	112042	21.5N 151.3E	PCV 6		DNSP17	BASED ON APPARENT LLCC	ROON
12	112200	21.5N 151.3E	PCV 6	TU+0/1+0 /SD+0/22HRS	DNSP16	EXPOSED LLCC	PGT#
13	120023	21.5N 151.3E	PCV 6		DNSP16	CI DRY EXPOSED LLCC	PGT#
14	120423	21.5N 150.5E	PCV 6		DNSP17	CI DRY EXPOSED LLCC	PGT#
15	120423	24.5N 150.4E	PCV 6		DNSP16		ROON
16	121042	24.5N 150.4E	PCV 6		DNSP17		PGT#
17	122022	25.5N 150.4E	PCV 6	TU+0/1+0 /SD+0/22HRS	DNSP17	EXPOSED LLCC	PGT#

TROPICAL DEPRESSION 27

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DATA/RAN CODE	SAT	COMMENTS	SITE
1	042111	7.5N 152.5E	PCV 5	TU+0/0+0	DNSP16	INIT JHS	PGT#
2	090450	5.5N 152.5E	PCV 6		DNSP17		PGT#
3	100455	7.5N 152.5E	PCV 6		DNSP16		PGT#
4	102101	6.5N 151.4E	PCV 6		DNSP16		PGT#
5	102217	6.5N 151.2E	PCV 6	TU+0/1+0	DNSP16	INIT JHS	PGT#
6	111323	6.5N 151.5E	PCV 6		DNSP16		PGT#
7	111802	6.5N 151.5E	PCV 6	TU+5/1.5/-00/5/22HRS	DNSP17		PGT#
8	112200	9.5N 145.4E	PCV 6		DNSP16		PGT#
9	120205	10.5N 145.4E	PCV 6		DNSP15		PGT#
10	120423	10.7N 147.1E	PCV 6		DNSP17	CI SA4E	PGT#
11	121022	11.5N 147.1E	PCV 6		DNSP16		PGT#
12	121547	11.5N 147.1E	PCV 6		DNSP15		PGT#
13	122324	11.5N 139.0E	PCV 6	TU+0/1.5 /WD+5/22HRS	DNSP16		PGT#
14	130147	11.5N 138.6E	PCV 6		DNSP15		PGT#
15	130206	12.5N 137.1E	PCV 6		DNSP17		PGT#
16	131207	13.5N 136.2E	PCV 6		DNSP16		PGT#
17	131429	13.5N 136.2E	PCV 6		DNSP15		PGT#
18	132144	16.5N 136.2E	PCV 6	TU+0/2+0 /DI+0/22HRS	DNSP17		PGT#
19	132305	16.5N 133.1E	PCV 6		DNSP16		PGT#
20	140129	17.5N 133.3E	PCV 6		DNSP15		PGT#
21	141325	19.5N 132.0E	PCV 6		DNSP17	CI DRY 2ND 15.5N 132.0E	PGT#
22	141349	19.5N 131.4E	PCV 6		DNSP16	2ND 15.5N 130.7E	PGT#
23	141411	20.5N 131.4E	PCV 6		DNSP15		PGT#
24	142125	14.5N 131.4E	PCV 6		DNSP17		ROON
25	142259	16.5N 130.3E	PCV 6	TU+0/2+0 /SD+0/22HRS	DNSP16		PGT#
26	151132	15.5N 129.2E	PCV 6		DNSP16		PGT#
27	152105	16.5N 129.4E	PCV 6		DNSP17		PGT#
28	152105	17.5N 130.3E	PCV 6		DNSP17		ROON

CO-CRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	HIV	DS5	MAX-SFC-HWD	MAX-FLT-LVL-IND	ACCRY	EYE SHAPE	EYE ORIENT- DIA/M/TATION	EYE TEMP(C) UNIT/ IN/ DR/SST	MSN
1	120539	8.5N 144.7E	1500FT	1005	15 090	60	200	17 090	40	5 6	+25 +26 +21	28 3
2	130153	10.5N 138.5E	1500FT	1003	15 120	35	170	24 050	72	10 5	+26	25 4

TYPHOON PHYLLIS

SATELLITE FIXES

FIX NU.	TIME (Z)	FIX POSITION	ACCRY	DVDRK CODE	SAT	COMMENTS	SITE
1	131248	10.8N 165.8E	PCN 6		DNSP15		PGTW
2	132003	10.9N 164.9E	PCN 6	TU+0/0+0	DNSP17		PGTW
3	132125	10.1N 164.7E	PCN 6		DNSP16		PGTW
4	132349	10.8N 163.3E	PCN 6	T1+5/1.5	DNSP15	INIT JDS	KGM/C
5	141008	11.3N 163.2E	PCN 6		DNSP16		PGTW
6	141230	11.8N 163.4E	PCN 6		DNSP15	CI UP	PGTW
7	141943	11.4N 162.4E	PCN 4	TU+0/0+0 /50+0/24HRS	DNSP17		PGTW
8	142107	11.4N 163.1E	PCN 4		DNSP16		PGTW
9	150325	10.4N 162.0E	PCN 6		DNSP17		PGTW
10	150350	10.6N 161.6E	PCN 6		DNSP16	CI UP	PGTW
11	150351	10.7N 162.9E	PCN 6		DNSP16		NNUL
12	151212	10.5N 161.7E	PCN 5		DNSP15		PGTW
13	151212	10.4N 161.6E	PCN 6		DNSP15		NNUL
14	151224	10.2N 161.1E	PCN 5	T2+0/12+0 /02+0/24HRS	DNSP17		PGTW
15	151226	10.0N 161.5E	PCN 4		DNSP17		KGM/C
16	152020	10.3N 161.2E	PCN 5		DNSP16		PGTW
17	160054	10.3N 161.0E	PCN 5		DNSP15		PGTW
18	160055	10.5N 160.3E	PCN 6		DNSP17		PGTW
19	160805	10.1N 159.7E	PCN 6		DNSP17		KGM/C
20	160808	10.5N 159.5E	PCN 4		DNSP17		NNUL
21	160933	10.5N 159.8E	PCN 5		DNSP16	CI UP	PGTW
22	161336	10.7N 159.6E	PCN 5		DNSP15		PGTW
23	161336	10.6N 159.4E	PCN 4		DNSP15	HUT INFLOW SW-5 QUADS	NNUL
24	162033	10.6N 158.6E	PCN 6		DNSP16		PGTW
25	170036	10.8N 158.5E	PCN 1	T4+0/4+0/02+0/24HRS	DNSP15		PGTW
26	170036	10.9N 158.5E	PCN 1	T4+5/4+5	DNSP15	INIT JDS WELL DFND CL SML EYE	NNUL
27	170115	10.6N 157.0E	PCN 6		DNSP16		PGTW
28	171318	10.4N 157.2E	PCN 1		DNSP15		PGTW
29	171318	10.0N 157.0E	PCN 2		DNSP15	WELL DFND CC SML EYE VSAL	NNUL
30	172157	10.4N 156.9E	PCN 1	T4+5/4+5 /00+5/22HRS	DNSP16		PGTW
31	172157	10.4N 156.0E	PCN 1	T3+0/5+0 /00+5/21HRS	DNSP16	WELL DFND CC EYE VSBL	NNUL
32	181040	20.4N 155.3E	PCN 1		DNSP16		PGTW
33	181040	21.0N 155.2E	PCN 2		DNSP16	SML EYE VSBL	NNUL
34	181040	20.8N 155.5E	PCN 6		DNSP16		RODN
35	181300	20.3N 155.1E	PCN 3		DNSP15		PGTW
36	181300	20.4N 155.2E	PCN 2		DNSP15		NNUL
37	182139	21.1N 155.5E	PCN 2	T4+5/4+5 /50+0/24HRS	DNSP16	SML EYE VSBL	PGTW
38	182140	21.0N 155.5E	PCN 3	T3+0/5+5 /00+5/24HRS	DNSP16	1 DEG CDO STNG LL INFLOW ALQDS	NNUL
39	190000	23.0N 155.5E	PCN 1		DNSP15	RAGGED EYE	PGTW
40	190000	22.1N 155.6E	PCN 2		DNSP16	HUT LL INFLOW ALQDS	NNUL
41	191022	22.9N 155.6E	PCN 2		DNSP16		PGTW
42	191242	23.2N 155.7E	PCN 2		DNSP15		PGTW
43	192122	23.9N 155.1E	PCN 2	T3+0/5+0 /00+5/24HRS	DNSP16		PGTW
44	200126	24.1N 154.7E	PCN 3		DNSP15		PGTW
45	201005	25.2N 154.3E	PCN 2		DNSP16		PGTW
46	201406	25.5N 154.2E	PCN 2		DNSP15		PGTW
47	201406	25.4N 154.2E	PCN 2		DNSP15		RKSO
48	202105	26.5N 153.5E	PCN 3	T4+5/5+0 /WU+5/24HRS	DNSP16		PGTW
49	210106	27.2N 153.6E	PCN 4	T4+0/4+0	DNSP15	INIT JDS	KGM/C
50	210106	27.3N 153.1E	PCN 4		DNSP15		PGTW
51	210106	27.5N 153.5E	PCN 4	T4+5/4+5	DNSP15	INIT JDS	RODN
52	210307	24.4N 153.1E	PCN 4		DNSP16	CI UP&Y	PGTW
53	211308	29.2N 155.0E	PCN 1		DNSP15		RODN
54	211308	29.3N 154.4E	PCN 4		DNSP15		PGTW
55	212048	31.0N 154.5E	PCN 5		DNSP16		PGTW
56	220048	31.2N 150.0E	PCN 5	T3+0/4+0 /W1+5/27HRS	DNSP15		PGTW
57	220749	36.5N 145.6E	PCN 6		DNSP16		KGM/C
58	221329	40.3N 171.3E	PCN 6		DNSP15		KGM/C

AIRCRAFT FIXES

FIX NU.	TIME (Z)	FLT POSITION	FLT LVL	MIN HGT	DBS MSLP	MAX-SFC-WND VEL/ARG/HNG	MAX-FLT-LVL-WND DTH/VEL/ARG/HNG	ACCRY	EYE SHAPE	EYE ORIEN-	EYE TEMP (F) DIA/M/TIN/DO/SSI	MSV NO.
1	140330	15.9N 140.6E	700MB	7015	992	55 030	20	130	60 030	15	+14 +17 + 9	1
2	161447	16.3N 159.5E	700MB	2964	986	nan	52 360	20	5 5	CIRCULAR	+16 +16 +11	2
3	170355	17.3N 158.1E	700MB	2907	980	40 220	30	320	55 220	15	+ 9 +13 +13	3
4	171451	18.7N 156.8E	700MB	2820	968	360	80 270	10	3 5	CIRCULAR	+25	4
5	171557	14.9N 156.7E	700MB			320	85 260	10		ELLIPICAL	20 12 350	5
6	180295	20.0N 155.3E	700MB	2707	953	30 140	10	270	83 140	10	+11 +16	6
7	180515	20.3N 155.3E	700MB	2709	50 060	70	120	105 060	10	+19 +19 + 8	7	
8	182321	22.0N 145.3E	700MB	2740	957	100 160	15	270	90 160	15	+12 +20 +12	8

RADAR FIXES

FIX NU.	TIME (Z)	RADAR POSITION	RADAR ACCRY	EYE SHAPE	EYE DIAM	RADAR-CODE ANALYST TDOFF	COMMENTS	RADAR POSITION	SITE WIND NO.
1	182042	21.9N 155.4E	ACFT				54 WRS		

SUPER TYPHOON RITA

SATELLITE FIXES

FIX NO.	TIME	FIX NO.	POSITION	ACQRY	OVERLAY CODE	SAT	COMMENTS	SITE
1	140313	10.0N 174.5E				DMSR14		
2	142213	9.5N 177.0E				DMSR14		
3	150312	9.0N 174.1E			T1.5/0.5	DMSR15	OPR LVL ANTICYCLONE	PHNL
4	161155	9.1N 170.2E				DMSR15		KGNC
5	161156	9.0N 170.5E				DMSR15		KGNC
6	162033	9.0N 170.4E			T1.5/1.5	DMSR15	INIT JWS	NNUL
7	162033	9.0N 170.2E	PCN 6	PCN 6	T1.5/1.5	DMSR15	WELL DEFINED EYES	KGNC
8	162035	9.0N 170.5E	PCN 6	PCN 6	T1.5/1.5	DMSR15	WELL DEFINED HAWKING BANDS	NNUL
9	171349	9.0N 177.7E				DMSR16		PHNL
10	170915	10.0N 177.2E	PCN 6	PCN 6		DMSR16		PGTM
11	170915	9.5N 177.4E	PCN 6	PCN 6		DMSR16		KGNC
12	171015	9.0N 176.7E	PCN 6	PCN 6		DMSR16	MOT LVL LVL INFLOW ALBOS	NNUL
13	171125	10.0N 176.8E	PCN 6	PCN 6		DMSR16	MOT LVL LVL INFLOW ALBOS	NNUL
14	171135	9.0N 176.5E	PCN 6	PCN 6		DMSR16		PHNL
15	171955	10.0N 175.2E	PCN 6	PCN 6		DMSR17	MOT LVL LVL INFLOW ALBOS	NNUL
16	172015	10.0N 174.5E	PCN 6	PCN 6	T1.5/1.5 / 50.0/24HRS	DMSR17		KGNC
17	180349	10.0N 171.0E				DMSR17	1.5 DEG CDO	PHNL
18	180725	10.0N 171.5E	PCN 6	PCN 6		DMSR17		NNUL
19	180857	10.0N 172.4E	PCN 6	PCN 6	T1.5/1.5 / 5.0/24HRS	DMSR18		KGNC
20	180957	10.0N 171.1E	PCN 6	PCN 6		DMSR18	MOT LVL LVL INFLOW ALBOS	NNUL
21	181113	11.0N 172.1E	PCN 6	PCN 6		DMSR18		PHNL
22	181113	10.0N 171.9E	PCN 6	PCN 6	T2.5/2.5 / 01.0/16HRS	DMSR18		KGNC
23	190008	11.0N 170.0E	PCN 3	PCN 3	T3.0/3.0	DMSR18	INIT JWS	PGTM
24	190008	11.0N 169.5E	PCN 2	PCN 2	T2.5	DMSR18	EYE BARELY DISCERNIBLE TWIT DRS	NNUL
25	191956	11.0N 168.3E	PCN 6	PCN 6		DMSR18		PHNL
26	191242	11.0N 167.3E	PCN 6	PCN 6		DMSR18		NNUL
27	191242	11.0N 167.4E	PCN 6	PCN 6		DMSR18		PGTM
28	191348	11.0N 167.2E	PCN 6	PCN 6	T3.0/3.0 / 00.0/20HRS	DMSR18	STRONG LOW LVL INFLOW ALBOS	NNUL
29	192122	11.0N 166.1E	PCN 2	PCN 2	T4.0/4.0 / 01.0/24HRS	DMSR18		PGTM
30	192122	11.0N 165.4E	PCN 2	PCN 2	T5.0/5.0	DMSR18	NO GEOGRAPHY	PHNL
31	192342	12.0N 164.0E	PCN 2	PCN 2	T9.5/4.5	DMSR18	INIT JWS	KGNC
32	201005	11.0N 161.7E	PCN 6	PCN 6		DMSR18		PGTM
33	201225	11.0N 161.0E	PCN 2	PCN 2		DMSR18		PGTM
34	201225	11.0N 161.2E	PCN 2	PCN 2		DMSR18		NNUL
35	202105	11.0N 159.8E	PCN 1	PCN 1	T2.5/5.5 / 01.0/24HRS	DMSR18		PGTM
36	210105	11.0N 157.7E	PCN 2	PCN 2		DMSR18		PGTM
37	210105	11.0N 154.6E	PCN 1	PCN 1	T2.5/5.5 / 02.0/24HRS	DMSR18	EYE V33 STRONG LOW LVL INFLOW	NNUL
38	210947	11.0N 155.6E	PCN 6	PCN 6		DMSR18	OPR LVL ANTICYCLONE	PGTM
39	211348	10.0N 155.4E	PCN 6	PCN 6		DMSR18	UPR LVL ANTICYCLONE	NNUL
40	212050	11.0N 154.4E	PCN 1	PCN 1	T0.0/6.0 / 00.0/19HRS	DMSR18	EYE DISCERNED BY THIN DVC	NNUL
41	212249	11.0N 154.4E	PCN 1	PCN 1	T0.5/6.5 / 01.0/25HRS	DMSR18		PGTM
42	220049	11.0N 152.7E	PCN 1	PCN 1		DMSR18	WELL DEFINED EYES	NNUL
43	220049	11.0N 153.2E	PCN 1	PCN 1		DMSR18		PGTM
44	221929	11.0N 151.5E	PCN 2	PCN 2		DMSR18		PGTM
45	220332	11.0N 152.4E	PCN 2	PCN 2		DMSR18		NNUL
46	221330	11.0N 151.0E	PCN 2	PCN 2		DMSR18		PGTM
47	221330	11.0N 151.0E	PCN 2	PCN 2		DMSR18		RDN
48	221330	11.0N 151.0E	PCN 2	PCN 2		DMSR18		NNUL
49	222211	11.0N 149.0E	PCN 1	PCN 1	T7.0/7.0 / 01.0/26HRS	DMSR18	STRONG LOW LVL INFLOW ALBOS	NNUL
50	222212	11.0N 149.4E	PCN 1	PCN 1	T7.0/7.0 / 00.0/24HRS	DMSR18		PGTM
51	230912	12.0N 146.2E	PCN 2	PCN 2		DMSR18		NNUL
52	231055	11.0N 145.0E	PCN 2	PCN 2		DMSR18		PGTM
53	231312	12.0N 145.2E	PCN 1	PCN 1		DMSR18		PGTM
54	240911	11.0N 142.7E	PCN 2	PCN 2		DMSR18		PGTM
55	242153	12.0N 142.0E	PCN 1	PCN 1	T7.0/7.0 / 50.0/24HRS	DMSR18		PGTM
56	240155	12.0N 141.2E	PCN 1	PCN 1		DMSR18		PGTM
57	240155	12.0N 141.4E	PCN 1	PCN 1	T7.0/7.0	DMSR18	INIT JWS	RPMK
58	240952	12.0N 139.7E	PCN 2	PCN 2		DMSR18		RDN
59	240952	12.0N 139.7E	PCN 2	PCN 2		DMSR18		PGTM
60	241035	12.0N 139.0E	PCN 2	PCN 2		DMSR18		PGTM
61	241943	12.0N 139.7E	PCN 2	PCN 2		DMSR18		PGTM
62	241943	12.0N 137.0E	PCN 2	PCN 2		DMSR18	EYE DIA 20NM	NNUL
* 63	242133	12.0N 140.1E	PCN 1	PCN 1	T7.0/7.0	DMSR18	EYE DIA 20NM INIT DRS	NNUL
64	242133	12.0N 142.4E	PCN 1	PCN 1	T7.0/7.5 / 00.0/20HRS	DMSR18		RPMK
65	242319	12.0N 141.3E	PCN 1	PCN 1	T7.0/7.5 / 00.0/25HRS	DMSR18		PGTM
66	250135	12.0N 139.6E	PCN 1	PCN 1		DMSR18		RPMK
67	250135	12.0N 139.4E	PCN 1	PCN 1		DMSR18		PGTM
68	251018	13.0N 129.7E	PCN 1	PCN 1		DMSR18		RPMK
69	251018	13.0N 129.7E	PCN 1	PCN 1		DMSR18	EYE DIA 20NM	PGTM
70	251018	13.0N 129.5E	PCN 2	PCN 2		DMSR18	EYE DIA 20NM	NNUL
71	251201	13.0N 129.4E	PCN 1	PCN 1		DMSR18		PGTM
72	251201	13.0N 129.0E	PCN 2	PCN 2		DMSR18		RPMK
73	251201	13.0N 129.0E	PCN 2	PCN 2		DMSR18	EYE DIA 20NM	NNUL
74	251418	13.0N 129.2E	PCN 1	PCN 1		DMSR18		PGTM
75	251418	13.0N 129.5E	PCN 2	PCN 2		DMSR18	EYE DIA 20NM	NNUL
76	252113	13.0N 129.1E	PCN 1	PCN 1		DMSR18		RPMK
77	252255	12.0N 129.6E	PCN 1	PCN 1	T7.0/7.0 / 50.0/25HRS	DMSR18	EYE DIA 20NM	NNUL
78	252301	12.0N 129.5E	PCN 1	PCN 1	T7.0/7.5 / 00.0/26HRS	DMSR18		PGTM
79	260258	14.0N 124.3E	PCN 1	PCN 1	T0.0/7.0 - w1.0/30HRS	DMSR18		RPMK
80	260300	14.0N 124.3E	PCN 1	PCN 1		DMSR18		PGTM
81	261955	14.0N 122.4E	PCN 1	PCN 1		DMSR18		RDN
82	261955	14.0N 122.4E	PCN 1	PCN 1		DMSR18		RPMK
83	260955	14.0N 122.5E	PCN 2	PCN 2		DMSR18		RDN
84	261800	14.0N 122.5E	PCN 2	PCN 2		DMSR18	EYE DIA 20NM	NNUL
85	261143	14.0N 122.5E	PCN 1	PCN 1		DMSR18		PGTM
86	261342	15.0N 121.7E	PCN 2	PCN 2		DMSR18		RPMK
87	261342	15.0N 122.0E	PCN 1	PCN 1		DMSR18		RDN
88	261342	15.0N 121.9E	PCN 2	PCN 2		DMSR18	EYE DIA 15NM	NNUL
89	262235	15.0N 120.1E	PCN 5	PCN 5	T3.0/6.0 / 01.0/20HRS	DMSR18		RKS0
90	262235	15.0N 120.2E	PCN 5	PCN 5	T3.0/6.0 / 01.0/20HRS	DMSR18		RPMK

91	262355	16.4N 114.4E	PCN 3	14.5/4.5+	DNSH17	INIT JIS	ROJN
92	271025	16.4N 114.4E	PCN 3	14.5/4.5+/>0.0/24HRS	DNSH17	RPMK	
93	271242	16.4N 114.4E	PCN 3	14.5/5.5+/>0.5/24HRS	DNAAH	PG1#	
94	271117	16.4N 117.3E	PCN 3		DNSH17	ROJN	
95	271304	16.4N 117.3E	PCN 3		DNSH17	SMALL CHT VSHI	
96	271305	16.4N 117.3E	PCN 3		DNSH17	NNJL	
97	271504	17.4N 114.4E	PCN 4		DNSH17	RPMK	
98	271526	17.4N 114.4E	PCN 4		DNSH17	NNJL	
99	272215	17.4N 114.4E	PCN 4	14.5/4.5+/>0.5/24HRS	DNSH17	PG1#	
100	272217	16.4N 114.4E	PCN 4	14.5/4.5+/>0.5/24HRS	DNSH17	PG1#	
101	280003	16.4N 114.4E	PCN 3	14.5/5.5+/>1.5/24HRS	DNSH17	NNJL	
102	280005	16.4N 114.4E	PCN 3	14.	DNSH17	RPMK	
103	280006	16.4N 114.4E	PCN 3		DNSH17	NNJL	
104	280007	16.4N 114.4E	PCN 3		DNSH17	RPMK	
105	280008	16.4N 114.4E	PCN 3		DNSH17	NNJL	
106	280009	17.4N 114.4E	PCN 3		DNSH17	RPMK	
107	281251	16.4N 114.4E	PCN 3		DNSH17	NNJL	
108	281252	16.4N 114.4E	PCN 3		DNSH17	PG1#	
109	281253	16.4N 114.4E	PCN 3		DNSH17	RKSD	
110	281255	16.4N 114.4E	PCN 3		DNSH17	ROJN	
111	281256	16.4N 114.4E	PCN 3		DNSH17	RPMK	
112	282350	16.4N 114.4E	PCN 3	14.5/4.5+/>2.0/24HRS	DNSH17	PG1#	
113	282351	16.4N 114.4E	PCN 3	14.5/4.5+/>1.5/24HRS	DNSH17	PG1#	
114	282352	16.4N 114.4E	PCN 3	14.5/4.5+/>1.5/24HRS	DNSH17	ROJN	
115	291037	16.4N 114.4E	PCN 3		DNSH17	RKSD	
*116	291232	16.4N 114.4E	PCN 3		DNSH17	PG1#	
*117	291233	16.4N 114.4E	PCN 3		DNSH17	ROJN	
*118	291234	16.4N 114.4E	PCN 3		DNSH17	ROJN	
					DNSH17	RPMK	
					Possible Secondary 12.8N 109.0E	RPMK	

AIRCRAFT FIXES

FIX NO. (Z)	TIME POSITON	FLT LEVEL	HGT MSLP	DNS	MAX-SFC-IND VEL/HGT/RNG	MAX-FLT-LVL-IND HGT/VEL/BKG/ATC/NAV/MET	ACRY	EYE SHAPE	EYE ORIENT- TAN/TATION	EYE TEMP (F) OUT/ IN/ JOY/ST	MSN NO.	
1	180015	16.5N 174.2E	7000H	3095	1002	40 070	15	120 40 300	10 1 1	CIRCULAR	250	+11 +13 + 9
2	182230	16.4N 174.2E	7000H	3102		50 190	30	040 40 190	30			+11 +14 + 9
3	190255	16.4N 114.4E	7000H	3035	345	35 100	20	040 50 300	10 1 1	ELLIPICAL	10 05	+12 +14 + 9
4	191019	11.2N 117.3E	7000H	3032	995			040 65 340	15 7 3	CIRCULAR	120	+12 +13 + 9
5	191205	11.4N 117.3E	7000H	3024				140 70 300	15			3
6	191206	11.7N 117.3E	7000H	2913	968	100 300	3	040 100 310	10 2 1	CIRCULAR	80	+12 +16 +12
7	192305	11.5N 114.4E	7000H	2905		90 360	4	040 95 110	12			+15 +12
8	200355	11.7N 143.3E	7000H	2791	967	50 240	10	140 71 100	6 4 3	CIRCULAR	40	+10 +11 +11
9	200359	11.7N 142.6E	7000H	2830	970	75 290	10	040 80 290	10			+11 +11
10	202155	11.4N 119.4E	7000H	2732	959			200 40 160	1 1 1	CIRCULAR	40	+10 +16 + 9
11	202030	11.4N 119.4E	7000H	2663	238	130 180	10	140 45 220	15 1 1	CIRCULAR	50	+13 +20 +10
12	210200	11.4N 114.4E	7000H	2725	335	130 230	10	040 75 230	12 6 2	CIRCULAR	100	+12 +15 +14
13	210202	11.2N 114.4E	7000H	2665	245			040 95 300	10 5 1	CIRCULAR	60	+11 +21 +16
14	211150	11.5N 115.0E	7000H	2746	237			120 105 290	12 4 2	CIRCULAR	120	+12 +17 +14
15	211200	11.2N 154.4E	7000H	2747	230			040 110 310	24			+17 +14
16	212009	11.2N 154.2E	7000H	2432	925	110 160	5	120 95 160	12 4 2	CIRCULAR	100	+15 +17 +14
17	220054	11.3N 151.3E	7000H	2737		130 030	10	110 110 030	10			+16 +16
18	220307	11.3N 152.2E	7000H	2720	911	130 320	8	110 113 320	4 2 2	CIRCULAR	120	+13 +23 +17
19	220545	11.5N 152.2E	7000H	2720		120 250	10	120 110 250	7			+19 +13
20	220549	11.5N 151.8E	7000H	2719	913			120 112 320	12 4 2	CIRCULAR	130	+11 +19 +16
21	221222	11.4N 151.1E	7000H	2713				140 98 160	12			+21 +12
22	221430	11.6N 150.9E	7000H	2717	997			120 122 310	6 2 2	CIRCULAR	100	+11 +20 +12
23	222222	11.5N 149.4E	7000H	2711	988	130 330	5	020 110 300	12 4 3	CIRCULAR	100	+12 +29 +14
24	230202	11.7N 149.4E	7000H	2706	482	150 100	5	120 105 030	12 4 2	CIRCULAR	120	+12 +31 + 9
25	230335	11.9N 146.4E	7000H	2755	944			140 115 210	0 0 0	CIRCULAR	80	+12 +27 +10
26	231423	12.1N 144.7E	7000H	2782	499			020 127 330	15 3 3	CIRCULAR	120	+11 +21 +13
27	232035	11.9N 142.9E	7000H	2765	997	115 020	20	120 120 190	10 5 2	CIRCULAR	130	+13 +20 +18
28	240217	12.2N 141.2E	7000H	2705	900			020 120 250	0 5 5	CIRCULAR	190	+11 +17 +17
29	240315	12.4N 140.2E	7000H	2765	997	140 0		140				+26 +13
30	242008	12.5N 136.7E	7000H	2751	495			020 109 230	14 4 1	CIRCULAR	160	+12 +19 +13
31	241306	12.6N 135.2E	7000H	2733				020 110 320	12			+19 +16
32	242027	12.9N 134.3E	7000H	2773	486	20 080	38	160 135 080	10 1 1	CIRCULAR	130	+12 +26 +16
33	250019	12.7N 133.2E	7000H	2664	482	130 230	10	140 115 080	15 4 2	CIRCULAR	120	+25 +10
34	251311	12.4N 132.1E	7000H	2707	978	130 010	12	140 110 010	10 1 1	CIRCULAR	100	+12 +27 +10
35	251419	13.6N 128.0E	7000H	2761	946			140 110 220	10 5 4	CIRCULAR	150	+12 +18 +14
36	251302	13.7N 126.4E	7000H	2724	489			040 114 330	30			+17 +14
37	252001	13.8N 126.5E	7000H	2723	492			020 116 190	20 5 1	CIRCULAR	200	+10 +18 +17
38	270357	16.4N 117.8E	7000H	2766	986	55 360	17	130 56 020	12 2 1	CIRCULAR	220	+13 + 8
39	271205	16.4N 117.4E	7000H	2755	984			040 44 300	12			+13 +16
40	271411	17.6N 117.0E	7000H	2770	987			170 44 080	25	2 2		+12 +13 +17
41	272030	17.2N 117.4E	7000H	2734	990			170 54 090	130 0 0	CIRCULAR	250	+11 +14 +11
42	280321	16.4N 115.4E	7000H	2784	988	35 050	30	040 57 310	90 5 2			+12 + 8
43	280521	16.4N 114.2E	7000H	2779	988	35 060	30	140 49 000	120			+12 + 8

RADAR FIXES

FIX NO. (Z)	TIME POSITION	HAIR	ACRY	EYE SHAPE	EYE DIAM	WADING-CUE ASIAN TUOFF	COMMENTS	MSR POSITION	SIF NO. NO.
1	230320	11.7N 147.7E	LAND	GGUU	CIRCULAR	10		EYE	13.0N 146.9E 01218
2	230410	11.8N 147.3E	LAND	GGUU	CIRCULAR	10		EYE	13.0N 146.9E 01218
3	230435	11.4N 147.3E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
4	230510	11.8N 147.3E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
5	230535	11.9N 147.3E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
6	230610	11.8N 147.1E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
7	230635	11.8N 147.0E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
8	230710	11.8N 146.7E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
9	230735	12.0N 146.7E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
10	230835	12.0N 146.4E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
11	230910	12.0N 146.3E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
12	230935	12.0N 146.3E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
13	231010	12.1N 146.0E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
14	231035	12.2N 145.7E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218
15	231110	12.2N 145.7E	LAND	GGUU	CIRCULAR	15		EYE	13.0N 146.9E 01218

10	231135	12+20 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
17	231210	12+20 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
18	231225	12+20 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
19	231310	12+20 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
20	231325	12+20 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
21	231410	12+20 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
22	231425	12+20 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
23	231510	12+20 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
24	231525	12+20 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
25	232010	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
26	232025	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
27	232110	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
28	232125	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
29	232140	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
30	232155	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
31	232210	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
32	232225	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
33	232310	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
34	232325	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
35	232410	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
36	232425	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
37	232500	11+40 145.5E	LAND	GOOD	CIRCULAR	15	EYE	13.ON 145.9E 91218	
38	260000	14+50 125.5E	LAND	CIRCULAR	25	10410 52930	EYE OPEN E	14.ON 122.7E 98447	
39	260001	14+50 125.5E	LAND	CIRCULAR	25	EYE MOVG NW 10KTS	PARADES	14.ON 122.7E 98447	
40	260100	14+50 125.5E	LAND	CIRCULAR	25	EYE MOVG NW 10KTS	PARADES	14.ON 122.7E 98447	
41	260100	14+50 125.5E	LAND	CIRCULAR	25	EYE BECOMING LARGER	14.ON 122.7E 98447		
42	260200	14+50 125.5E	LAND	CIRCULAR	25	EYE	14.ON 122.7E 98447		
43	260200	14+50 125.5E	LAND	CIRCULAR	25	10410 52740	PARADES	14.ON 122.7E 98447	
44	260200	14+50 125.5E	LAND	CIRCULAR	25	11240 308//	14.ON 122.7E 98447		
45	260300	14+50 125.5E	LAND	CIRCULAR	25	30840 52930	14.ON 122.7E 98447		
46	260300	14+50 125.5E	LAND	CIRCULAR	25	10411 52510	MOVG Z/TW AVG SPD 10KTS PARADES	14.ON 122.7E 98447	
47	260300	14+50 125.5E	LAND	CIRCULAR	25	10411 52510	MOVG Z/TW AVG SPD 10KTS PARADES	14.ON 122.7E 98447	
48	260400	14+50 125.5E	LAND	CIRCULAR	25	10411 52510	MOVG Z/TW AVG SPD 10KTS PARADES	14.ON 122.7E 98447	
49	260500	14+50 125.5E	LAND	CIRCULAR	25	10411 52510	MOVG Z/TW AVG SPD 10KTS PARADES	14.ON 122.7E 98447	
50	260500	14+50 125.5E	LAND	CIRCULAR	25	20840 61030	14.ON 122.7E 98447		
51	260530	14+50 125.5E	LAND	CIRCULAR	25	47777 47777	14.ON 122.7E 98447		
52	260550	14+50 125.5E	LAND	CIRCULAR	25	EYE CIRCULAR OPEN SE	14.ON 122.7E 98447		
53	260550	14+50 125.5E	LAND	CIRCULAR	25	EYE CIRCULAR OPEN SE	14.ON 122.7E 98447		
54	260700	14+50 125.5E	LAND	CIRCULAR	25	EYE CIRCULAR OPEN SE	14.ON 122.7E 98447		
55	260700	14+50 125.5E	LAND	CIRCULAR	25	EYE CIRCULAR OPEN SE	14.ON 122.7E 98447		
56	260730	14+50 125.5E	LAND	CIRCULAR	25	EYE CIRCULAR OPEN SE	14.ON 122.7E 98447		
57	260800	14+50 125.5E	LAND	CIRCULAR	25	EYE CIRCULAR OPEN S	14.ON 122.7E 98447		
58	260800	14+50 125.5E	LAND	CIRCULAR	25	EYE CIRCULAR OPEN S	14.ON 122.7E 98447		
59	260820	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE CIRCULAR OPEN S	14.ON 122.7E 98447	
60	260830	14+50 125.5E	LAND	POOH	CIRCULAR	25	WALL CLD	14.ON 122.7E 98447	
61	260840	14+50 125.5E	LAND	POOH	CIRCULAR	25	10421 47777	14.ON 122.7E 98447	
62	260840	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE CIRCULAR OPEN	14.ON 122.7E 98447	
63	260930	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE MOVG NW 10KTS	14.ON 122.7E 98447	
64	261000	14+50 125.5E	LAND	POOH	CIRCULAR	25	10711 47777	14.ON 122.7E 98447	
65	261030	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE CIRCULAR OPEN S	14.ON 122.7E 98447	
66	261030	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE MOVG NW 10KTS	14.ON 122.7E 98447	
67	261100	14+50 125.5E	LAND	POOH	CIRCULAR	25	10410 52708	GOZAR	14.ON 122.7E 98447
68	261100	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE OPEN SW	14.ON 122.7E 98447	
69	261110	14+50 125.5E	LAND	POOH	CIRCULAR	25	10410 52900	GOZAR	14.ON 122.7E 98447
70	261200	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE MOVG NW BRIS	14.ON 122.7E 98447	
71	261200	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE CIRCULAR 100 PERCENT	14.ON 122.7E 98447	
72	261200	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE OPEN S	14.ON 122.7E 98447	
73	261210	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE MOVG NW 10KTS	14.ON 122.7E 98447	
74	261300	14+50 125.5E	LAND	POOH	CIRCULAR	25	10721 47777	GOZAR	14.ON 122.7E 98447
75	261300	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE CIRCULAR	14.ON 122.7E 98447	
76	261310	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE OPEN SW-S	14.ON 122.7E 98447	
77	261330	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE OPEN SW-S	14.ON 122.7E 98447	
78	261330	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE ELLIPTICAL	14.ON 122.7E 98447	
79	261400	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE MOVG NW BRIS	14.ON 122.7E 98447	
80	261400	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE OPEN SE-S	14.ON 122.7E 98447	
81	261430	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE CIRCULAR	14.ON 122.7E 98447	
82	261430	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE OPEN S-S	14.ON 122.7E 98447	
83	261500	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE MOVG NW 10KTS	14.ON 122.7E 98447	
84	261500	14+50 125.5E	LAND	POOH	CIRCULAR	25	10411 52808	PARADES	14.ON 122.7E 98447
85	261510	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE OPEN SW	14.ON 122.7E 98447	
86	261530	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE OPEN NW	14.ON 122.7E 98447	
87	261550	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE CIRCULAR	14.ON 122.7E 98447	
88	261700	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE MOVG NW 10KTS	14.ON 122.7E 98447	
89	261700	14+50 125.5E	LAND	POOH	CIRCULAR	25	EYE CIRCULAR	14.ON 122.7E 98447	
90	261730	14+50 125.5E	LAND	FAIR	CIRCULAR	25	CNR FILLED AND DRY LAND	14.ON 122.7E 98447	
91	261810	14+50 125.5E	LAND	FAIR	CIRCULAR	25	EYE CIRCULAR OPEN SE	14.ON 122.7E 98447	
92	261830	14+50 125.5E	LAND	FAIR	CIRCULAR	25	CNR REFUNNING # OF MINS	14.ON 122.7E 98447	
93	261910	14+50 125.5E	LAND	FAIR	CIRCULAR	25	CNR NFG WALL CLD	14.ON 122.7E 98447	
94	261930	14+50 125.5E	LAND	FAIR	CIRCULAR	25	CNR NFG WALL CLD	14.ON 122.7E 98447	
95	262010	14+50 125.5E	LAND	FAIR	CIRCULAR	25	CNR NFG WALL CLD	14.ON 122.7E 98447	
96	262030	14+50 125.5E	LAND	FAIR	CIRCULAR	25	CNR NFG WALL CLD	14.ON 122.7E 98447	
97	262105	14+50 125.5E	LAND	FAIR	CIRCULAR	25	CNR NFG WALL CLD	14.ON 122.7E 98447	
98	262130	14+50 125.5E	LAND	FAIR	CIRCULAR	25	CNR	14.ON 122.7E 98447	
99	262200	14+50 125.5E	LAND	FAIR	CIRCULAR	25	NFG WALL CLD	14.ON 122.7E 98447	
100	262235	14+50 125.5E	LAND	POOH	ELLIPICAL	12301 //	EYE ELLIPTICAL	14.ON 122.7E 98447	
101	262300	14+50 125.5E	LAND	POOH	ELLIPICAL	12301 //	MNG N 24KTS AXIS 18/12 WALLACE	14.ON 122.7E 98447	
102	262300	14+50 125.5E	LAND	POOH	ELLIPICAL	12301 //	NFG WALL CLD	14.ON 122.7E 98447	
103	262308	14+50 125.5E	LAND	POOH	ELLIPICAL	12301 //	NFG WALL CLD	14.ON 122.7E 98447	
104	270000	14+50 119.5E	LAND	POOH	CONCENTRIC	12511 //	EYE ELLIPTICAL	14.ON 122.7E 98447	
105	270030	14+50 119.5E	LAND	POOH	CONCENTRIC	12511 //	EYE MOVG NW 20KTS	14.ON 122.7E 98447	
106	270100	14+50 119.5E	LAND	POOH	CIRCULAR	22	WALLACE	14.ON 122.7E 98447	
107	270200	14+50 119.5E	LAND	POOH	CIRCULAR	22	10411 47777	14.ON 122.7E 98447	
108	270200	14+50 119.5E	LAND	POOH	CIRCULAR	22	EYE MOVG NW 10KTS	14.ON 122.7E 98447	
109	270300	14+50 119.5E	LAND	POOH	CIRCULAR	22	EYE CIRCULAR	14.ON 122.7E 98447	
110	270300	14+50 119.5E	LAND	POOH	CIRCULAR	22	EYE STINY	14.ON 122.7E 98447	
111	270300	14+50 119.5E	LAND	POOH	CIRCULAR	22	EYE MOVG NW 10KTS	14.ON 122.7E 98447	
112	270500	14+50 119.5E	LAND	POOH	CIRCULAR	14	EYE MOVG NW 6KTS	14.ON 122.7E 98447	
113	270500	14+50 119.5E	LAND	POOH	CIRCULAR	14	EYE MOVG NW 10KTS	14.ON 122.7E 98447	
114	270500	14+50 119.5E	LAND	POOH	CIRCULAR	14	EYE ELLIPTICAL	14.ON 122.7E 98447	
115	270500	14+50 119.5E	LAND	POOH	CIRCULAR	14	EYE FIX USING 10 DEG SPRL OVRLY	14.ON 122.7E 98447	

TROPICAL STORM TESS

SATELLITE FIXES

FIX NO.	TIME (Z)	FLT POSITION	ACCRY	UVTRAK CODE	SAT	COMMENTS	SITE
1	310134	14.4N 144.7E	PCN 6	T4+0/0+0	DNSH16	INIT DS	PGT#
2	310131	14.0N 144.0E	PCN 5		DNSH15		PGT#
3	310135	14.2N 144.4E	PCN 5		DNSH16		PGT#
4	310205	13.2N 144.5E	PCN 4	T4+0/1+0 /D1+0/23HRS	DNSH17		PGT#
5	310225	13.1N 144.1E	PCN 3		DNSH16		PGT#
6	010238	13.5N 143.7E	PCN 6		DNSH17		PGT#
7	011140	13.5N 143.9E	PCN 5		DNSH16		PGT#
8	011324	13.5N 143.9E	PCN 6		DNSH16		PGT#
9	012039	13.0N 143.9E	PCN 6	T2+0/2+0 /D1+0/24HRS	DNSH17		PGT#
10	012241	13.0N 144.0E	PCN 5		DNSH16		PGT#
11	020055	13.4N 144.5E	PCN 5		DNSH15		PGT#
12	020117	17.5N 145.4E	PCN 6		DNSH17		PGT#
13	020219	17.3N 145.4E	PCN 6		DNSH17		RODN
14	020213	17.3N 145.4E	PCN 6		DNSH17		PGT#
15	021135	13.4N 145.6E	PCN 6		DNSH16		PGT#
16	021337	13.5N 145.6E	PCN 6		DNSH16		RODN
17	022223	14.5N 145.2E	PCN 5	T2+5/2+5 /00+5/26HRS	DNSH16		PGT#
18	030037	14.5N 145.3E	PCN 6		DNSH15		PGT#
19	030900	13.3N 145.3E	PCN 6		DNSH17		PGT#
20	030900	13.4N 145.4E	PCN 6		DNSH17		RODN
21	031106	13.4N 145.5E	PCN 5		DNSH16		PGT#
22	031319	13.3N 145.5E	PCN 6		DNSH16		PGT#
23	032205	21.1N 146.5E	PCN 5	T3+5/3+5 /01+0/24HRS	DNSH16		PGT#
24	040201	21.3N 146.5E	PCN 5		DNSH15		PGT#
25	040300	22.4N 146.6E	PCN 6		DNSH17		PGT#
26	040300	22.7N 146.6E	PCN 4		DNSH17		RODN
27	041049	22.7N 147.0E	PCN 3		DNSH16		PGT#
28	041301	21.2N 147.0E	PCN 6		DNSH15		PGT#
29	042149	25.0N 147.2E	PCN 3	T4+0/4+0/00+5/24HRS	DNSH16		PGT#
30	042149	24.7N 147.4E	PCN 4	T3+0/3+0	DNSH16	INIT DS	RODN
31	050143	26.0N 148.5E	PCN 4		DNSP15		PGT#
32	050121	27.3N 148.4E	PCN 4		DNSP17		PGT#
33	051031	27.7N 149.3E	PCN 3		DNSP16		PGT#
34	051031	27.7N 149.5E	PCN 4		DNSP16		RODN
35	051426	24.3N 146.1E	PCN 3		DNSP15		PGT#
36	051426	24.2N 146.0E	PCN 3		DNSP15		RKS0
37	050131	24.5N 152.0E	PCN 4	T3+5/3+5/00+5/26HRS	DNSP16		RODN
38	052141	20.3N 151.4E	PCN 6	T3+0/4+0 /W1+0/26HRS	DNSP16		PGT#
39	060124	30.4N 153.1E	PCN 4		DNSP15		PGT#
40	061013	32.9N 157.0E	PCN 6		DNSP16	UPR ANTICYCLONE CI DOWN	PGT#
41	061407	31.3N 159.0E	PCN 6		DNSP15		PGT#
42	061407	34.0N 159.4E	PCN 5		DNSP15		RKS0

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FLT POSITION	FLT LVL	MIV HGT	DBS MSLP	MAX-SFC-WND VEL/ARG/RNG	MAX-FLT-LVL-WND DTH/VEL/DNG/RNG	ACCRY NAV/MET	EYE SHAPE	EYE DIREC- DIAM/TATION	EYE TEMP (C) OUT/ IN/ DO/SST	MSV NO.
1	012157	15.4N 144.3E	700MB	3032	995	30 180 90	220 27 180 90	3 5		+26 +26 +25 24	1	
2	020303	17.3N 144.5E	700MB	3005	991	15 270 90	020 20 270 120	5 4		+12 +11		
3	021504	14.3N 144.9E	700MB	3012	992		200 33 120 120	3 2		+12 +12	2	
4	021910	14.6N 145.0E	700MB	2991	989		180 40 120 90			+12 +12		
5	022106	14.6N 145.3E	700MB	2998	990		180 44 080 120	3 4		+10 +10	2	
6	030131	14.2N 145.6E	1500FT	2990	990	25 190 120	140 31 190 120			+26 +24	3	
7	030229	14.5N 145.6E	1500FT	2988	988	55 350 90	140 35 080 60	1 2		+26 +26 +23 24	3	
8	040302	14.7N 145.7E	700MB	2958						+14 +12	3	
9	051429	10.5N 146.6E	700MB	2901	977		170 65 080 120	5 2	ELLIPICAL 35 20 180	+14 +14 +12	4	
10	031900	20.5N 146.4E	700MB	2914	981		140 50 360 90			+14 +14	6	
11	032010	20.7N 146.3E	700MB	2922	981	35 270 90	120 77 050 90	5 3		+10 +14 +12	6	
12	040003	21.2N 146.5E	700MB	2920	981	50 120 75	280 60 180 120	5 3		+10 +15 +14	5	
13	041200	23.1N 147.6E	700MB	2976	973		220 77 120 90			+16 +16	5	
14	041445	23.5N 147.4E	700MB	2984	974		120 62 200 90	3 5		+17 +11	5	
15	050024	25.5N 148.0E	700MB	2901	976	65 190 100	140 45 040 100	2 4		+16 +15 +12	7	
16	050300	26.1N 148.4E	700MB	2892	977	70 130 90	210 75 130 130	2 4		+13 +15 +13	7	
17	060304	31.7N 153.2E	700MB	2974	975	55 190 30	240 80 120 90	5 5		+15 +16 +12	9	

TROPICAL DEPRESSION 32

SATELLITE FIXES

FIX NO.	TIME (Z)	POSITION	ACCRY	Dvorak Code	SAT	COMMENTS	SITE
1	152341	15.2N 129.7E	PCN 6	T0+0/0.0	DMSP36	INIT OBS	PGTW
2	152341	15.0N 130.1E	PCN 5	T1+5/1.5	DMSP36	INIT OBS	NNUL
3	152342	16.7N 131.4E	PCN 5	T1+0/1.0	DMSP36	INIT OBS	RPMK
4	161449	16.2N 129.0E	PCN 5		DMSP37		NNUL
5	161223	15.4N 129.7E	PCN 6		DMSP36	CI UP	PGTW
6	161431	16.6N 129.8E	PCN 6		DMSP35		NNUL
7	162324	16.5N 129.7E	PCN 6	T2+5/2.5 /D1+0/24HRS	DMSP36		NNUL
8	162324	16.6N 130.1E	PCN 5	T1+0/1.0 /D1+0/24HRS	DMSP36		PGTW
9	162324	16.6N 130.3E	PCN 5	T1+5/1.5 /D0+5/24HRS	DMSP36		RPMK
10	170313	16.4N 129.0E	PCN 6		DMSP35		NNUL
11	170930	16.8N 129.3E	PCN 6		DMSP37	CI SAME	PGTW
12	170931	16.6N 130.3E	PCN 6		DMSP37		NNUL
13	170932	17.1N 129.6E	PCN 6		DMSP37		RODN
14	171206	16.8N 130.7E	PCN 6		DMSP36		NNUL
15	171206	17.0N 129.3E	PCN 6		DMSP36		PGTW
16	171413	17.4N 130.5E	PCN 6		DMSP35		NNUL
17	171413	17.1N 129.5E	PCN 6		DMSP35		PGTW
18	171413	18.1N 130.4E	PCN 6		DMSP35	UPPER LVI	RPMK
19	172212	17.0N 129.5E	PCN 5		DMSP37		NNUL
20	172212	14.6N 126.8E	PCN 3	T3+0/3.0-/D2+0/23HRS	DMSP37		PGTW
21	172212	14.6N 126.7E	PCN 3	T3+0/3.0	DMSP37	INIT OBS	RODN
22	172307	14.8N 126.7E	PCN 3		DMSP36		PGTW
23	180255	15.1N 128.0E	PCN 5	T2+0/2.5 /W0+5/27HRS	DMSP35		NNUL
24	180255	14.9N 127.0E	PCN 3		DMSP35		PGTW
25	180255	15.2N 127.2E	PCN 3	T1+5/1.5 /S0+0/27HRS	DMSP35		RPMK
26	181052	14.5N 127.4E	PCN 5		DMSP37	BASED ON CONTINUITY OF FEATURES	PGTW
27	181052	14.4N 127.6E	PCN 5		DMSP37	NO APPARENT CNTNR	RODN
28	181536	14.3N 126.8E	PCN 6		DMSP35	BASED ON CONTINUITY OF FEATURES	PGTW
29	181537	14.3N 126.3E	PCN 5		DMSP35		RPMK
30	182158	16.0N 125.9E	PCN 5	T1+0/2.0 /W2+0/24HRS	DMSP37		PGTW
31	190237	13.4N 125.6E	PCN 3		DMSP35		PGTW
32	190237	13.4N 124.9E	PCN 5	T1+0/2.0 /W1+0/24HRS	DMSP35		NNUL
33	191032	13.5N 124.8E	PCN 5		DMSP37		PGTW
34	191033	13.4N 125.2E	PCN 5		DMSP37		RODN
35	191518	13.5N 124.3E	PCN 5		DMSP35		PGTW
36	191518	14.0N 124.0E	PCN 5		DMSP35		RPMK

TYphoon VIOLA

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	UVN/VRK CODE	SAT	COMMENTS	SITE
1	152159	11.1N 149.7E	PCN 6	TU+0/0+0	DMSR36	INIT JAS	PGT#
2	161042	5.9N 149.4E	PCN 6	DMSR36	CI UP	PGT#	
3	162049	6.2N 149.6E	PCN 6	DMSR36	PGT#		
4	162142	6.4N 149.3E	PCN 6	TI+5/1.5 /01.5/24HRS	DMSR36	PGT#	
5	170930	4.1N 149.3E	PCN 5	DMSR36	PGT#		
6	171024	4.3N 149.4E	PCN 6	DMSR36	PGT#		
7	171613	4.3N 149.4E	PCN 6	DMSR36	PGT#		
8	171613	4.3N 149.4E	PCN 6	DMSR36	NNUL		
9	172030	0.2N 149.4E	PCN 6	DMSR36	PGT#		
10	172307	0.4N 149.4E	PCN 5	T3+0/3.0 /01.5/24HRS	DMSR36	PGT#	
11	172307	0.4N 149.7E	PCN 3	T3+0/3.0	DMSR36	NNUL	
12	180113	9.5N 149.4E	PCN 5	DMSR36	PGT#		
13	181005	11.1N 149.3E	PCN 6	DMSR36	PGT#		
14	181355	11.1N 149.2E	PCN 6	DMSR36	PGT#		
15	181355	11.1N 149.1E	PCN 6	DMSR36	RDN		
16	181355	11.2N 149.1E	PCN 4	DMSR36	NNUL		
17	182152	11.4N 149.5E	PCN 3	DMSR36	NNUL		
18	182159	11.2N 149.3E	PCN 5	DMSR36	PGT#		
19	182249	11.2N 149.3E	PCN 3	T9+0/4.0 /01.0/24HRS	DMSR36	NNUL	
20	182249	11.5N 149.1E	PCN 5	T3+5/3.5 /00.5/24HRS	DMSR36	PGT#	
21	190237	12.2N 139.6E	PCN 5	T3+5/3.5+	DMSR36	RPNK	
22	190237	12.2N 140.0E	PCN 5	DMSR36	PGT#		
23	190237	12.3N 140.4E	PCN 1	DMSR36	NNUL		
24	190951	12.3N 139.4E	PCN 6	DMSR36	PGT#		
25	191130	12.4N 139.0E	PCN 6	DMSR36	PGT#		
26	191133	13.1N 139.2E	PCN 4	DMSR36	NNUL		
27	191336	12.9N 137.7E	PCN 6	DMSR36	PGT#		
28	192132	14.2N 136.5E	PCV 1	T4.5/4.5 /01.0/24HRS	DMSR37	PGT#	
29	192133	14.2N 136.2E	PCV 1	DMSR37	NNUL		
30	192232	14.2N 136.2E	PCN 5	DMSR36	PGT#		
31	192232	14.2N 136.2E	PCN 5	DMSR36	RPNK		
32	201013	15.1N 133.6E	PCN 1	DMSR37	PGT#		
33	201013	15.1N 134.9E	PCN 1	DMSR37	RDN		
34	201113	15.2N 135.0E	PCN 1	DMSR36	PGT#		
35	201113	15.1N 134.8E	PCN 2	DMSR36	NNUL		
36	201500	15.3N 134.3E	PCN 1	DMSR36	PGT#		
37	201501	15.3N 134.5E	PCN 2	DMSR36	NNUL		
38	2n2113	15.3N 133.6E	PCN 2	DMSR37	PGT#		
39	2n2113	15.3N 133.5E	PCN 2	DMSR37	RDN		
40	202356	16.0N 133.2E	PCV 2	T5+5/5.5 /01.0/24HRS	DMSR36	PGT#	
41	212000	16.1N 133.0E	PCV 1	T6+0/6.0	DMSR36	RPNK	
42	212001	16.2N 132.9E	PCN 1	DMSR36	PGT#		
43	212001	16.2N 132.6E	PCN 1	DMSR36	NNUL		
44	212056	16.2N 131.4E	PCN 1	DMSR37	PGT#		
45	212056	16.3N 132.0E	PCV 1	DMSR37	NNUL		
46	212056	17.0N 131.6E	PCV 1	DMSR36	PGT#		
47	212236	16.5N 131.5E	PCV 1	DMSR36	RPNK		
48	212443	17.2N 131.1E	PCV 1	DMSR36	PGT#		
49	212443	16.9N 131.6E	PCV 2	DMSR36	NNUL		
50	212053	14.1N 130.2E	PCN 5	DMSR37	PGT#		
51	212235	14.4N 129.4E	PCV 2	T5+5/5.0	DMSR37	RDN	
52	212338	14.3N 129.7E	PCN 3	T5+5/5.5 /W0.5/24HRS	DMSR36	PGT#	
53	220143	19.5N 129.0E	PCV 1	T5+0/6.0 /W1.0/24HRS	DMSR36	RPNK	
54	220143	18.5N 129.7E	PCN 1	DMSR36	PGT#		
55	220143	19.5N 129.0E	PCN 1	DMSR36	NNUL		
56	220143	19.7N 128.4E	PCN 5	DMSR37	PGT#		
57	220336	20.3N 128.2E	PCV 4	DMSR37	RPNK		
58	221220	20.2N 128.2E	PCV 5	DMSR36	PGT#		
59	221255	21.2N 128.2E	PCV 6	DMSR36	NNUL		
60	221255	20.2N 128.0E	PCV 5	DMSR36	PGT#		
61	222215	21.1N 129.3E	PCV 1	T4.5/5.0 /W0.5/24HRS	DMSR37	PGT#	
62	222221	21.1N 129.3E	PCV 1	DMSR36	PGT#		
63	231056	24.1N 131.5E	PCV 3	DMSR37	CI UWY		
64	231056	23.9N 133.7E	PCV 3	DMSR37	RDN		
65	231056	24.0N 131.7E	PCV 4	DMSR37	NNUL		
66	231056	23.9N 133.7E	PCV 3	DMSR37	RKS0		
67	231203	24.3N 131.8E	PCV 5	DMSR36	PGT#		
68	232155	25.2N 131.9E	PCV 6	T3+0/4.0 /W1.5/24HRS	DMSR37	PGT#	
69	232303	25.2N 131.7E	PCV 4	DMSR36	PGT#		
70	240248	25.3N 134.6E	PCV 4	DMSR36	PGT#		

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FLY POSITION	FLT LVL	MIN HGT	MSP	MAX-SFC-WND	MAX-FLT-LVL-4WD	ACCRY	EYE	EYE DIREC-	EYE TEMP (C)	MSN NO.	
			LVL	HGT	MSP	VEL/HRG/R40	HTH/VEL/BHG/RNG	NAV/MET	SHAPE	DIM/MAT/TION	OUT/ IN/ 3D/SST		
1	170710	4.2N 149.7E	1500FT	398	30 270	53 110	35 340	120	5 10	+23 +23	29	2	
2	172118	4.2N 149.4E	700MM	3045	55 330	25 070	40 330	100	10 10	+11 +12 +16	3	3	
3	180208	4.4N 144.4E	700MM	3062	209	40 160	50 080	50 360	100	5 5	+14 +16	5	5
4	180841	14.4N 144.4E	700MM	3025	993	30 120	30 090	18 360	120	5 5	CIRCULAR	90	3
5	180832	16.6N 124.0E	700MM	3017	993	35 070	40 100	44 070	60	5 5	CIRCULAR	50	5
6	182100	11.5N 141.1E	700MM	2986	984	40 060	35 140	48 060	120	5 5	ELLIPICAL	30 20 360	5
7	190028	11.2N 140.0E	700MM	2985	986	65 010	30 100	55 010	60	5 5	ELLIPICAL	30 20 360	5
8	191223	11.4N 129.7E	700MM	2984	986	55 050	50 150	57 050	90	5 5	CIRCULAR	600	6
9	191505	11.3N 137.5E	700MM	2986	977	100	77 090	35	10 7	CIRCULAR	+11 +15 + 0	7	

10	200023	14.0N 136.4E	700MM	2831	970	55 050 120	240 87 100 27	* 2				+16 +12	4
11	201200	14.0N 136.1E	700MM	2792	966	47 100 27	020 78 310 20	* 2	CIRCULAR	400	+15 +15 +11	8	
12	201347	15.3N 136.3E	700MM	2570	218	060 94 340 28	* 1	CIRCULAR	250	+12 +18 +10	2		
13	210308	15.6N 137.4E	700MM	2354	912	120 120 15	200 120 160 10	* 1	CIRCULAR	250	+13 +26 +8	10	
14	210515	15.8N 137.5E	700MM	2331	413	120 200 15	060 127 090 10				+30 +14	10	
15	210705	15.8N 137.0E	700MM	2312	411	060 105 220 10	* 3	CIRCULAR	220	+14 +20 +15	11		
16	211337	17.1N 131.2E	700MM	2361	417	070 101 350 20	* 2	CIRCULAR	200	+12 +21 +14	11		
17	220049	19.2N 129.4E	700MM	2452	25	080 120 180 90 060 30	ELLIPICAL 45 40	350	+17 +17	12			
18	220322	19.7N 129.6E	700MM	2431	325	30 130 30	180 120 110 40	* 2	CIRCULAR	350	+16 +18 +16	12	
19	221340	20.7N 129.4E	700MM	2444	338	170 110 100 60	* 3	CIRCULAR	300	+13 +17 +8	13		
20	222112	21.1N 129.7E	700MM	2393	364	50 240 120 040	170 110 100 60	* 3	CIRCULAR	100	+11 +15 +15	13	
21	231154	25.2N 130.4E	700MM	2994	394	25 090 20	180 58 090 90	* 3			+16 +16 +9	15	
22	240030	25.2N 131.9E	1500FT	393	25 170 15	190 33 170 15	* 3			+23 +23 +23	25	15	

TROPICAL STORM WINNIE

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACQRY	OVERTRK CODE	SAT	COMMENTS	SITE
1	232155	8.5N 161.9E	PCN 6	T0+0/0+0	DMSP16	INIT JIS	PGTM
2	251044	10.5N 155.3E	PCN 6	T0+0/0+0 /SD+0/24HRS	DMSP15		PGTM
3	251946	12.2N 154.4E	PCN 6		DMSP16		PGTM
4	251331	12.5N 151.7E	PCN 6		DMSP15		PGTM
5	252228	12.5N 151.1E	PCN 6	T0+0/0+0 /SD+0/21HRS	DMSP16		PGTM
6	261031	12.3N 150.4E	PCN 6		DMSP15	SECONDARY PSN 14.7N 154.4E	PGTM
7	261110	11.5N 147.4E	PCN 5		DMSP15		PGTM
8	262231	11.0N 148.5E	PCN 5	TU+0/0+0 /SD+0/24HRS	DMSP16		PGTM
9	271052	12.4N 149.6E	PCN 6		DMSP15		PGTM
10	271255	11.0N 149.2E	PCN 6		DMSP15		PGTM
11	272037	14.2N 147.5E	PCN 6		DMSP17		PGTM
12	272153	14.3N 147.4E	PCN 5	T2+0/2+0 /D2+0/24HRS	DMSP16		PGTM
13	280137	14.9N 147.5E	PCN 5		DMSP15		PGTM
14	281035	17.0N 146.8E	PCN 6		DMSP15		PGTM
15	281418	14.2N 146.7E	PCN 6		DMSP15		PGTM
16	292136	21.7N 146.2E	PCN 3	T3+5/3.5 /D1+3/24HRS	DMSP16		PGTM
17	290113	21.0N 146.4E	PCN 3		DMSP15		PGTM
18	290325	23.1N 146.0E	PCN 3		DMSP17		PGTM
19	291854	23.2N 147.9E	PCN 6		DMSP17		R004
20	291012	23.2N 146.2E	PCN 5		DMSP15		PGTM
21	291400	24.7N 146.7E	PCN 3		DMSP15		PGTM
22	291958	27.0N 147.9E	PCN 6		DMSP17	UPR LVG ANTICYCLONE	PGTM
23	291593	27.2N 147.1E	PCN 6		DMSP17		R004
24	292119	27.3N 151.7E	PCN 5	T2+0/2+0 /N1.5/24HRS	DMSP16		PGTM
25	300101	24.4N 156.3E	PCN 6		DMSP15		PGTM
26	301101	29.3N 157.9E	PCN 6	T1+0/1+0	DMSP15	INIT JIS	R004
27	300939	30.5N 154.9E	PCN 6		DMSP17	CI D004	PGTM
28	301000	30.4N 154.9E	PCN 6		DMSP16		PGTM

AIRCRAFT FIXES

FIX NO.	TIME (Z)	FIX POSITION	FLT LVL	MIV HGT	MISL	MAX-SFC-WND VEL/ARG/HNG	MAX-FLT-LVL-WND 01H/VEL/SHD/HNG NAV/MET	ACQRY	EYE SHAPE	EYE ORIEN-TATION	EYE TEMP (C) 01H/ INF DR/EST	MSN NO.
1	270700	11.6N 149.5E	1500FT	392	35 230 50	310 35 240 80	7 2				+25 +26 +24 29	4
2	270830	11.9N 149.5E	700MM	3038	294						+14 +12	4
3	272050	14.3N 149.1E	700MM	3017	391	35 360 10	110 36 020 80	* 2			+12 +13 +11	5
4	280419	15.3N 147.6E	700MM	2972	387	35 080 10	220 41 130 80	* 2			+12 +12 +12	5
5	280730	16.2N 147.5E	700MM	2988	389	45 050 50	160 69 030 80	* 2			+12 +12 +9	5
6	281210	17.4N 146.7E	700MM	2952	384		140 60 050 80	* 1			+12 +14 +11	7
7	281447	18.4N 146.3E	700MM	2972	384		200 52 150 90	* 4			+13 +13 +12	7
8	281805	19.5N 146.3E	700MM	2935	382		180 54 040 80	* 4			+13 +13 +13	7
9	282031	21.1N 146.2E	700MM	2884	975	50 140 30	230 68 140 90	* 2			+14 +15 +11	8
10	290019	20.9N 146.2E	700MM	2916			150 60 090 120				+14 +14	9
11	290224	21.4N 146.4E	700MM	2908	980	45 290 30	160 52 280 90	* 3			+13 +15 +13	9
12	291708	26.2N 151.1E	700MM	2897	978		280 64 220 100	* 2			+14 +15 +14	9

2. NORTH INDIAN OCEAN CYCLONE FIX DATA

TC18-78

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	UVDRAK CODE	SAT	COMMENTS	SITE
1	130450	10.4N 80.8E	PCV 6		DNSP15		KGWC
2	140058	11.2N 80.8E	PCV 6		DNSP15		KGWC
3	140432	11.8N 80.8E	PCV 6	T1+5/1.5 /00.5/24HRS	DNSP15		KGWC
4	141339	11.6N 87.1E	PCV 6		DNSP15		KGWC
5	141714	11.5N 86.1E	PCV 6		DNSP15		KGWC
6	150040	12.5N 89.4E	PCV 5		DNSP15		RPMK
7	150040	12.5N 89.4E	PCV 5		DNSP15		KGWC
8	150555	13.1N 90.2E	PCV 6	T2+5/2.5 /01.0/24HRS	DNSP15		KGWC
9	151323	13.0N 92.4E	PCV 6		DNSP15		KGWC
10	151557	13.2N 92.4E	PCV 6		DNSP15		KGWC
11	160204	15.3N 89.7E	PCV 6		DNSP15		KGWC
12	160528	16.8N 80.2E	PCV 6	T2+5/2.5 /#1.0/24HRS	DNSP15		KGWC
13	160533	16.3N 89.2E	CONF 1		DNSP		FuFS
14	161305	14.1N 91.3E	PCV 6		DNSP15		KGWC
15	161447	14.1N 91.3E	PCV 6		DNSP		KGWC
16	161920	14.3N 90.8E	PCV 6		DNSP15		KGWC
17	171157	14.4N 92.4E	PCV 6		DNSP15		KGWC
18	170152	14.5N 92.1E	CONF 1	T3+5/3.5 /01.5/24HRS	DNSP		FuFS
19	170420	14.5N 92.8E	PCV 4	T2+5/2.5 /01.0/24HRS	DNSP15		KGWC
20	171429	20.0N 93.8E	PCV 2		DNSP15		KGWC
21	171902	20.5N 94.3E	PCV 6		DNSP15		KGWC

TC19-78

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	UVDRAK CODE	SAT	COMMENTS	SITE
1	250056	12.7N 91.9E	PCV 6	T1+0/1.0	DNSP17	INITI JWS	KGWC
2	250459	13.0N 90.8E	PCV 3	T1+5/1.5	DNSP15	INITI J-S	KGWC
3	251337	14.1N 89.8E	PCV 5		DNSP17	GODU FEEDER HAND TO NORTH	KGWC
4	260036	15.2N 87.9E	PCV 6	T2+5/2.5 /01.0/20HRS	DNSP17	FEEDER HAND IN SE QUAD	KGWC
5	260441	15.5N 87.9E	PCV 6	T2+5/2.5 /01.0/24HRS	DNSP15		KGWC
6	261317	17.1N 86.9E	PCV 6		DNSP17		KGWC
7	261723	18.0N 87.1E	PCV 6		DNSP15		KGWC
8	270017	14.3N 87.3E	PCV 6		DNSP17	HVY CONVECTION NE	KGWC
9	270423	19.1N 88.1E	PCV 6		DNSP15		KGWC
10	270505	19.1N 88.3E	PCV 6	T3+0/3.0 /00.5/24HRS	DNSP15		KGWC
11	271258	20.5N 88.8E	PCV 6		DNSP17	DECHEASED ORGANIZATION	KGWC
12	271705	20.4N 90.0E	PCV 6		DNSP15		KGWC
13	280906	20.0N 92.8E	PCV 6		DNSP15		ROUN

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DVDRAK CODE	SAT	COMMENTS	SITE
1	051357	10.5N 71.5E	PCN 6	T2+0/2+0	DNSP16	INIT JWS	KGWC
2	051355	10.5N 71.5E	PCN 6		DNSP17	CI OUTFLOW WEST	KGWC
3	052129	10.5N 71.5E	PCN 6		DNSP18	INCREASED CONV ACTIVITY	KGWC
4	060205	10.5N 72.5E	PCN 6	T3+0/3+0	DNSP17	INIT JWS BASED ON CI OUTFLOW	KGWC
5	060529	11.5N 71.5E	PCN 7	T3+5/3+5	DNSP16	INIT JWS RAGGED EYE FORMING	KGWC
6	061003	11.5N 71.5E		T3+0	TINSON	CDO 1 JWS RAD CNTR	NRPB
7	061447	11.5N 70.5E	PCN 6		DNSP17	CENTER POORLY DEFINED	KGWC
8	061911	11.5N 70.5E	PCN 6		DNSP15		KGWC
9	070146	11.2N 48.5E	PCN 6	T3+5/4+5 /01+5/24HRS	DNSP17	BANDING MORE ORGANIZED	KGWC
10	070512	11.4N 47.1E	PCN 1	T3+5/4+5 /01+0/24HRS	DNSP15	EYE CI COVERED	KGWC
11	070556	13.0N 56.4E		T3+0	TINSON	CDO EXTENDS 10NM RAD OF CNTR	NRPB
12	071427	15.4N 46.1E	PCN 4		DNSP17		KGWC
13	071553	15.4N 45.3E	PCN 4		DNSP15		KGWC
14	080127	16.0N 43.7E	PCN 2		DNSP15	EYE 5 NM DIA	KGWC
15	080135	16.5N 43.5E	PCN 2	T3+0/4+0 /01+5/24HRS	DNSP15	EYE 20 NM DIA	KGWC
16	080448	17.5N 42.5E		T3+0	TINSON		NRPB
17	081407	17.5N 42.9E	PCN 6		DNSP15		KGWC
18	081835	17.8N 42.5E	PCN 6		DNSP15	NO EYE VSRL	KGWC
19	082019	19.2N 42.7E	PCN 6		DNSP15	BASED ON CONSERVATIVE FEATURES	KGWC
20	090249	14.6N 62.3E	PCN 2		DNSP17	RAGGED EYE VSRL LESS ORGANIZED	KGWC
21	090717	19.7N 62.2E	PCN 2	T3+5/5+5 /W1+5/24HRS	DNSP15		KGWC
22	091120	20.1N 62.8E	PCN 6		TINSON	CDO EXTENDS 10NM RAD OF CNTR	NRPB
23	091329	20.3N 62.7E	PCN 6		DNSP17	CDO ORIENTED NW-SW	KGWC
24	091359	20.5N 62.5E	PCN 6		DNSP15	DECREASED INTENSITY	KGWC
25	100229	21.8N 61.3E	PCN 4		DNSP17		KGWC
26	100559	22.2N 47.8E	PCN 3	T3+0/4+0 /W1+5/24HRS	DNSP15	NO SIGNIFICANT LLCC	KGWC
27	101111	22.3N 44.1E		T3+0	TINSON	45NM ILL DEFINED EYE	NRPB
28	101510	23.1N 44.2E	PCN 6		DNSP17	UPPER LVL ANTYCLONE	KGWC
29	101541	23.5N 44.4E	PCN 6		DNSP15	BASED ON APPNT LLCC	KGWC
30	110209	22.5N 44.0E	PCN 3		DNSP17	EXPANSED I LLCC	KGWC
31	110542	22.4N 44.8E	PCN 3	T3+5/2+5 /W1+5/24HRS	DNSP15		KGWC
32	110805	23.0N 48.5E	PCN 6		TINSON	NO OUTFLOW	NRPB
33	111450	22.9N 48.7E	PCN 6		DNSP17	NO CLEARLY DEFINED LLCC	KGWC
34	111923	23.0N 49.1E	PCN 6		DNSP15		KGWC
35	120150	22.6N 49.0E	PCN 6		DNSP17		KGWC
36	120523	22.5N 49.1E	PCN 4		DNSP15		KGWC

RADAR FIXES

FIX NO.	TIME (Z)	FIX POSITION	RADAR ACCRY	EYE SHAPE	EYF	RADING-CODE	COMMENTS	RADAR POSITION	SITE	MDO NO.
1	080710	14.7N 47.5E	ACFT				EYE 32 MILES WIDE			

SATELLITE FIXES

FIX NO.	TIME (Z)	FIX POSITION	ACCRY	DATAK CODE	SAT	COMMENTS	SITE
1	196114	7.9N 90.8E	PCN 6		DNSP17		KGWC
2	200055	8.0N 91.0E	PCN 6	T3+0/3+0	DNSP17	INITIAL OHS 001 ANTICYCLONE	KGWC
3	201542	8.0N 90.7E	PCN 1	T3+5/3+5	DNSP17	INITIAL OHS EYE DIAM 15NM	KGWC
4	201336	8.3N 89.5E	PCN 4		DNSP17		KGWC
5	201542	7.9N 89.2E	PCN 6		DNSP17		KGWC
6	210035	7.6N 88.8E	PCN 3	T3+5/3+5	DNSP17	INITIAL OHS	KGWC
7	210524	7.1N 88.0E	PCN 2	T4+0/4+0 /W0.5/24HRS	DNSP17		KGWC
8	211316	7.3N 87.4E	PCN 6		DNSP17		KGWC
9	211905	7.2N 87.3E	PCN 6		DNSP17		KGWC
10	220016	6.7N 86.3E	PCN 2		DNSP17		KGWC
11	220508	6.4N 85.6E	PCN 2	15+0/5+0 /D1+0/24HRS	DNSP17		KGWC
12	221903	7.0N 85.1E	PCN 2	15+0	DNSP17	COO EXTENDS 40NM RAD FROM CNTR	NRPG
13	221257	6.7N 84.8E	PCN 2		DNSP17		KGWC
14	221747	6.8N 84.6E	PCN 2		DNSP17		KGWC
15	231138	7.3N 83.7E	PCN 2		DNSP17		KGWC
16	231529	7.1N 83.3E	PCN 2	T5+5/6+5 /D1+5/24HRS	DNSP17		KGWC
17	230950	7.0N 83.0E	PCN 2		TTHSN	HELL JEFTED FYF	NRPG
18	231237	7.6N 81.7E	PCN 2		DNSP17		KGWC
19	231724	7.5N 81.4E	PCN 1		DNSP17		KGWC
20	240118	6.5N 80.5E	PCN 2	T5+0/6+0 /W1+5/20HRS	DNSP17		KGWC
21	241511	3.0N 79.9E	PCN 1		DNSP17		KGWC
22	241400	9.3N 79.2E	PCN 3		DNSP17		KGWC
23	241853	9.3N 77.5E	PCN 5		DNSP17		KGWC
24	250058	11.1N 75.7E	PCN 3	T4+0/5+0 /W1+3/24HRS	DNSP17		KGWC
25	250553	11.0N 74.0E	PCN 3		DNSP17		KGWC
26	251015	11.2N 73.7E			TTHSN		NRPG
27	251339	11.3N 73.3E	PCN 3		DNSP17		KGWC
28	251935	12.2N 72.7E	PCN 5		DNSP17	UPL LVL ANTICYCLONE	KGWC
29	260220	12.5N 71.5E	PCN 5	T4+5/6+5 /W0.5/22HRS	DNSP17		KGWC
30	260535	12.3N 71.3E	PCN 5		DNSP17		KGWC
31	261006	12.1N 71.0E		T4+0	TTHSN		NRPG
32	261320	13.7N 70.4E	PCN 5		DNSP17		KGWC
33	261917	14.3N 71.5E	PCN 5		DNSP17		KGWC
34	270201	14.2N 71.6E	PCN 5	T1+0/2+0-/W3.5/24HRS	DNSP17		KGWC
35	270559	14.6N 69.8E	PCN 3		DNSP17		KGWC
36	270926	14.8N 69.0E		T3+0	TTHSN	UPPER LVL SHEARING OFF	NRPG
37	271642	15.1N 67.4E	PCN 3		DNSP17		KGWC
38	271941	15.1N 67.4E	PCN 4		DNSP17		KGWC
39	280191	14.9N 67.4E	PCN 3	T2+0/3+0 /W1+0/20HRS	DNSP17		KGWC
40	280641	14.9N 69.4E	PCN 3	T1+5/2+5 /W1.5/24HRS	DNSP17		KGWC
41	280945	17.5N 70.4E			TTHSN		NRPG
42	281423	17.1N 67.4E	PCN 5		DNSP17		KGWC
43	281923	16.9N 68.2E	PCN 3		DNSP17		KGWC
44	280121	16.9N 68.2E	PCN 5		DNSP17		KGWC
45	290623	17.0N 68.0E	PCN 5	T0+0/1+0 /W1.5/24HRS	DNSP17		KGWC
46	291602	18.3N 68.4E	PCN 5		DNSP17		KGWC

APPENDIX

1. CONTRACTIONS

		KT	Knot(s)
AC&W	Aircraft Control and Warring System	LLCC	Low Level Circulation Center
ACCRY	Accuracy	LVL	Level
ACFT	Aircraft	M	Meter(s)
AIREP	Aircraft Weather Report(s) (Commercial and Military)	M/SEC	Meters per Second
ANT	Antenna	MAX	Maximum
APT	Automatic Picture Transmission	MB	Millibar(s)
ARWO	Aerial Reconnaissance Weather Officer	MET	Meteorological
ATT	Attenuation	MIN	Minimum
AVG	Average	MOHATT	Modified Hatrack
AWN	Automated Weather Network	MSN	Mission
BRG	Bearing	NAV	Navigational
CDO	Central Dense Overcast	NEDN	Naval Environmental Data Network
CI	Current Intensity	NEDS	Naval Environmental Display Station
CLD	Cloud	NESS	National Environmental Satellite Service
CLSD	Closed	NET	Near Equatorial Trough
CNTR	Center	NM	Nautical Mile(s)
CONF	Confidence (number)	NOAA	National Oceanic and Atmospheric Administration
DEG	Degree(s)	NTCC	Naval Telecommunications Center
DIAM	Diameter	OBS	Observation(s)
DIR	Direction	PCN	Position Code Number
DMSP	Defense Meteorological Satellite Program	PSBL	Possible
ELEV	Elevation	PTLY	Partly
FLT	Flight	QUAD	Quadrant
GOES	Geostationary Operational Environmental Satellite	RADOB	Radar Observation
HATRACK	Hurricane and Typhoon Tracking (numerical forecast)	RECON	Reconnaissance
HGT	Height	RNG	Range
HPAC	Mean of XTRP and Climatology	RPD	Rapid
HU	Hurricane	SAT	Satellite
HR	Hour(s)	SFC	Surface
HVY	Heavy	SLP (MSLP)	Sea Level Pressure (Minimum Sea Level Pressure)
ICAO	International Civil Aviation Organization	SMS	Synchronous Meteorological Satellite
IR	Infrared	SPOL	Spiral Overlay
KM	Kilometer(s)	SRP	Selective Reconnaissance Program
		STNRY	Stationary

ST	Super Typhoon
TC	Tropical Cyclone
TCARC	Tropical Cyclone Aircraft Reconnaissance Coordinator
TCM	Tropical Cyclone Model
TD	Tropical Depression
TIROS	Television Infrared Observation Satellite
TS	Tropical Storm
TY	Typhoon
TUTT	Tropical Upper Tropospheric Trough
VEL	Velocity
VIS	Visual
VSBL	Visible
WESTPAC	Western Pacific
WMO	World Meteorological Organization
WND	Wind
WRS	Weather Reconnaissance Squadron
XTRP	Extrapolation
Z	Zulu Time (Greenwich mean time)

2. DEFINITIONS

BEST TRACK - A subjectively smoothed path, versus a precise and very erratic fix-to-fix path, used to represent tropical cyclone movement.

CENTER - The axis or pivot of a tropical cyclone. Usually determined by wind, temperature or pressure distribution.

CYCLONE - A closed atmospheric circulation rotating about an area of low pressure (counterclockwise in the northern hemisphere).

EPHEMERIS - Position of a body (satellite) in space as a function of time. When no geographical reference is available for gridding satellite imagery, then only ephemeris gridding is possible which is solely based on the theoretical satellite position and is susceptible to errors from satellite pitch, orbit eccentricity and the non-spherical earth.

EXTRATROPICAL - A term used in warnings and tropical summaries to indicate that a cyclone has lost its "tropical" characteristics. The term implies both poleward displacement from the tropics and the conversion of the cyclone's primary energy sources from release of latent heat of condensation to baroclinic processes. The term carries no implications as to strength or size.

EYE - "EYE" is used to describe the central area of a tropical cyclone when it is more than half surrounded by wall cloud.

MAXIMUM SUSTAINED WIND - Maximum surface wind speed averaged over a 1-minute period of time. Peak gusts over water average 20 to 25 percent higher than sustained wind.

RECURVATURE - The turning of a tropical cyclone from an initial path toward the west of northwest to the north then northeast.

SIGNIFICANT TROPICAL CYCLONE - A tropical cyclone becomes "significant" with the issuance of the first numbered warning by the responsible warning agency.

SUPER TYPHOON/HURRICANE - A typhoon/hurricane in which the maximum sustained surface wind (1-minute mean) is 130 kt or greater.

TROPICAL CYCLONE - A nonfrontal low pressure system of synoptic scale developing over tropical or subtropical waters and having a definite organized circulation.

TROPICAL CYCLONE AIRCRAFT RECONNAISSANCE COORDINATOR - A CINCPACAF representative designated to levy tropical cyclone aircraft weather reconnaissance requirements on reconnaissance units within a designated area of the PACOM and to function as coordinator between CINCPACAF, aircraft weather reconnaissance units, and the appropriate typhoon/hurricane warning center.

TROPICAL DEPRESSION - A tropical cyclone in which the maximum sustained surface wind (1-minute mean) is 33 kt or less.

TROPICAL DISTURBANCE - A discrete system of apparently organized convection--generally 100 to 300 miles in diameter--originating in the tropics or subtropics, having a non-frontal migratory character, and having maintained its identity for 24 hours or more. It may or may not be associated with a detectable perturbation of the wind field. As such, it is the basic generic designation which, in successive stages of intensification, may be classified as a tropical depression, tropical storm or typhoon (hurricane).

TROPICAL STORM - A tropical cyclone with maximum sustained surface winds (1-minute mean) in the range of 34 to 63 kt, inclusive.

TROPICAL UPPER TROPOSPHERIC TROUGH (TUTT) - "A dominant climatological system, and a daily synoptic feature, of the summer season over the tropical North Atlantic, North Pacific and South Pacific Oceans," from Sadler, James C., Feb. 1976: Tropical Cyclone Initiation by the Tropical Upper Tropospheric Trough. (NAVENVPREDRSCHFAC Technical Paper No. 2-76).

TYPHOON/HURRICANE - A tropical cyclone in which the maximum sustained surface wind (1-minute mean) is 64 kt or greater. West of 180 degrees longitude they are called typhoons and east of 180 degrees they are called hurricanes. Foreign governments use these or other terms for tropical cyclones and may apply different intensity criteria.

WALL CLOUD - An organized band of cumuliform clouds immediately surrounding the central area of a tropical cyclone. The wall cloud may entirely enclose the eye or only partially surround the center.

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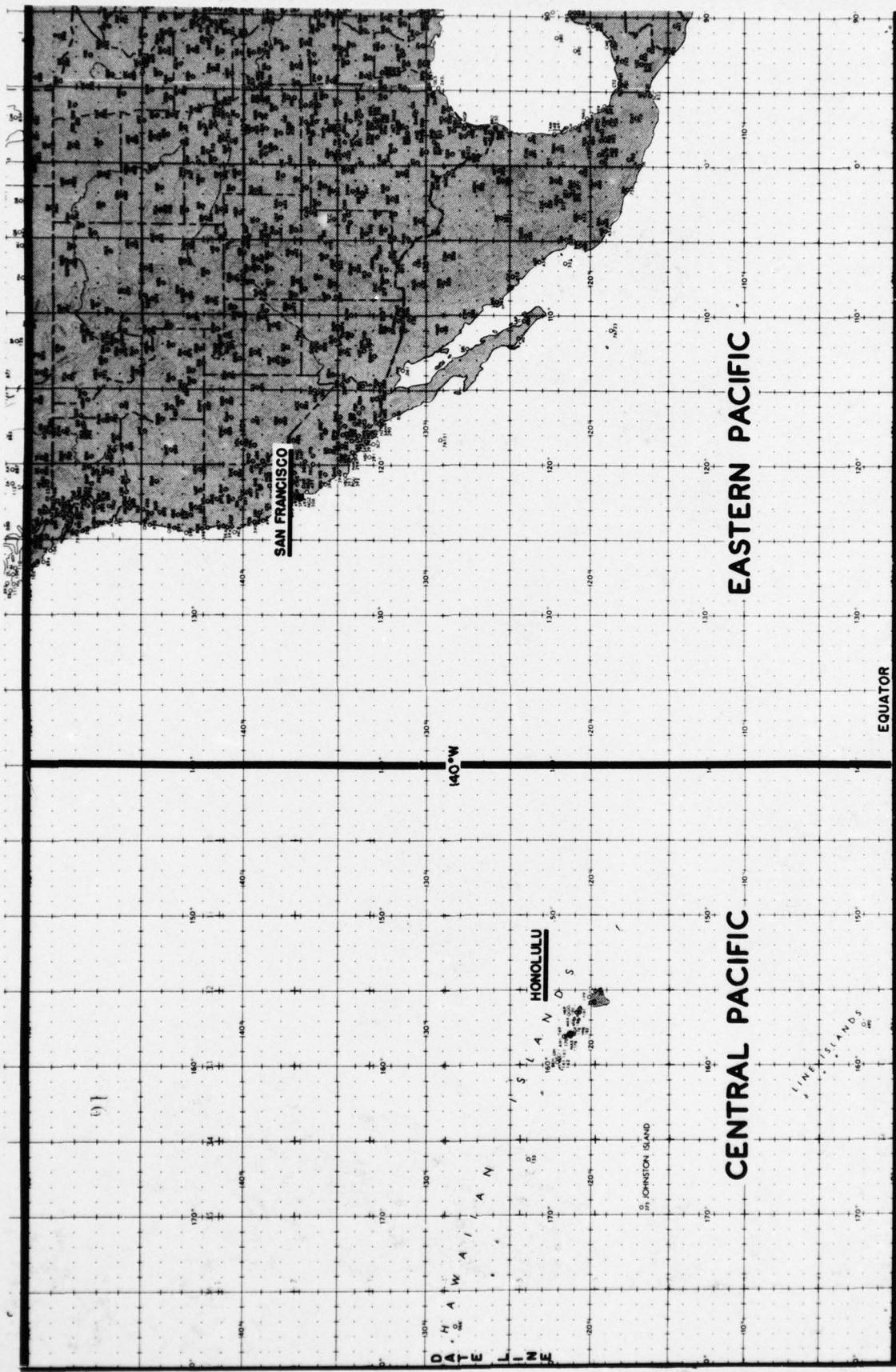
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